- New approach to maintenance control
- Gas heat for drying coated paper
- New waste paper recovery method
- West Virginia's expansion program

The Paper Industry

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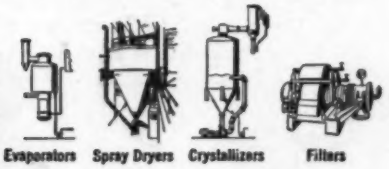

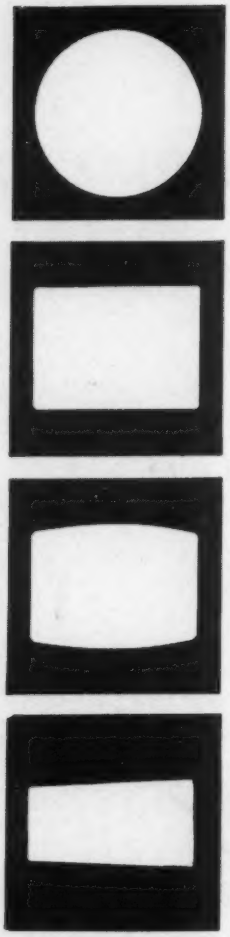

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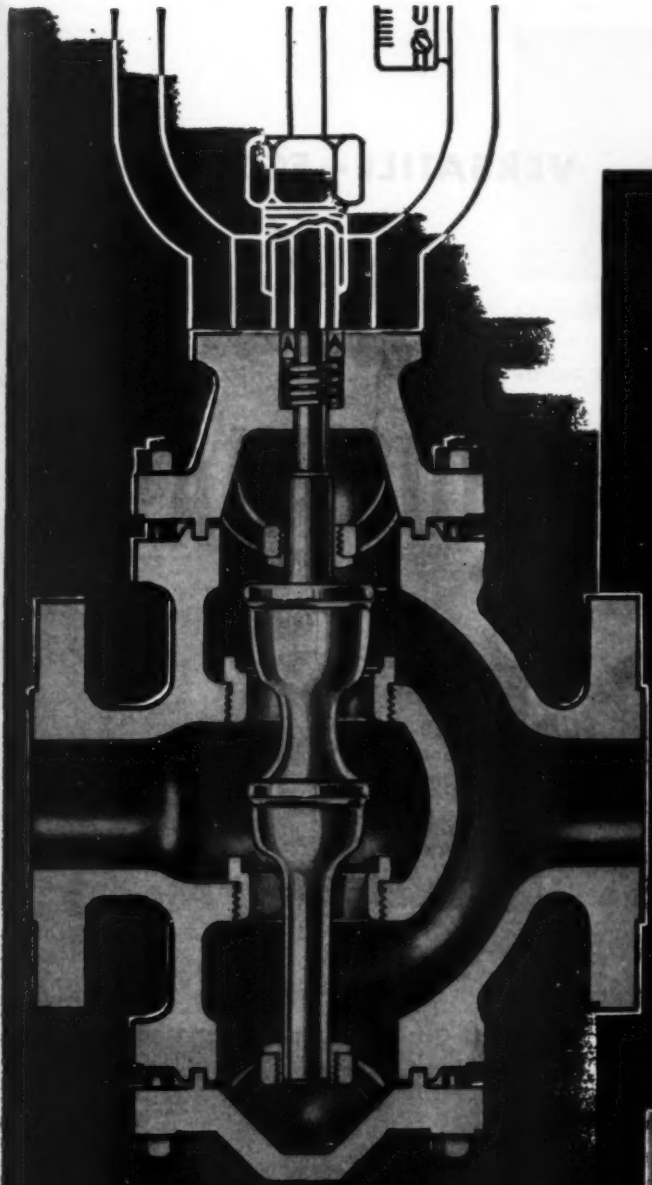

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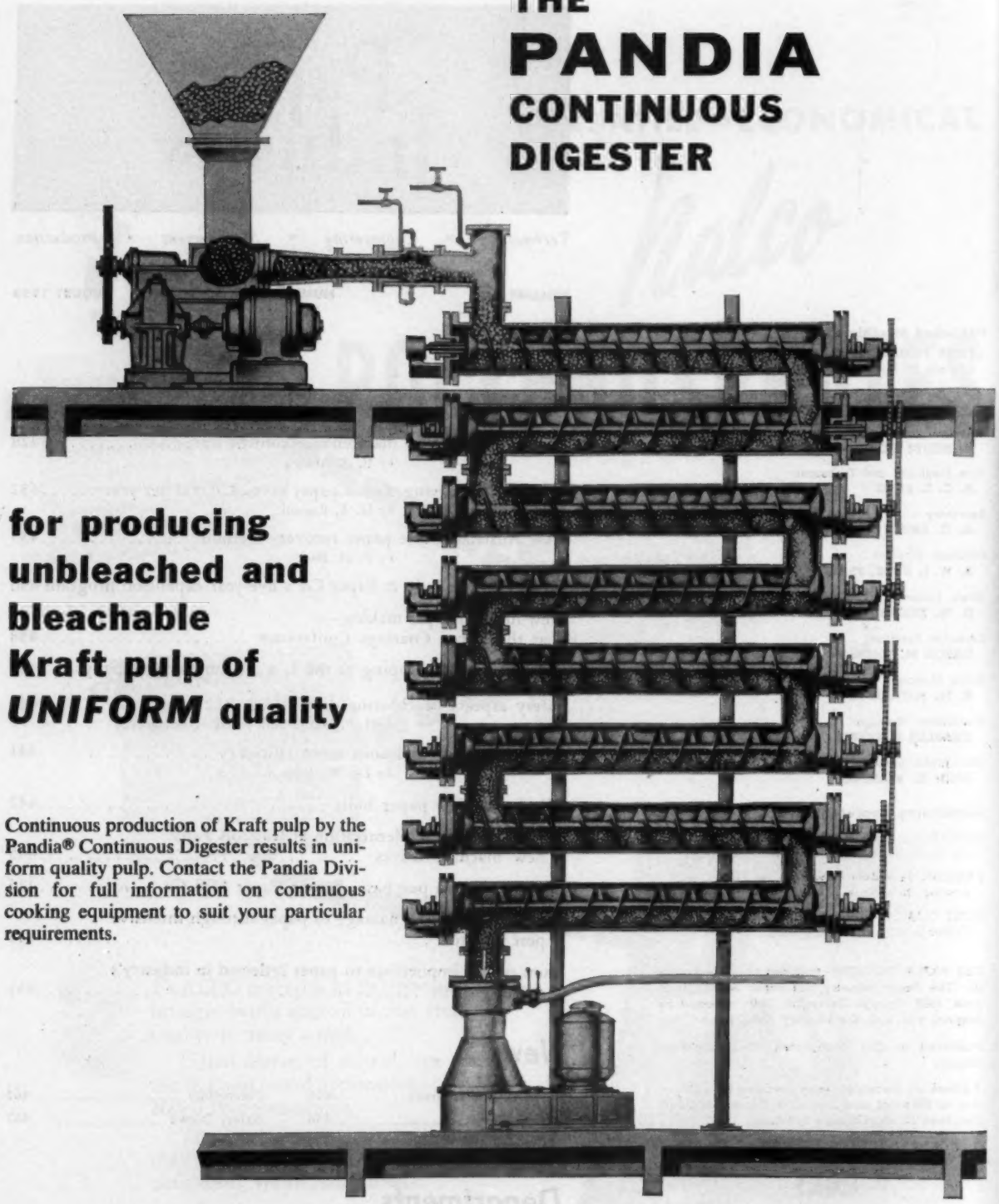

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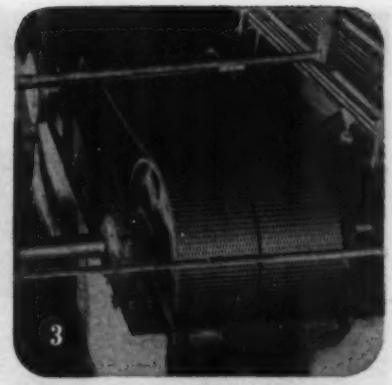

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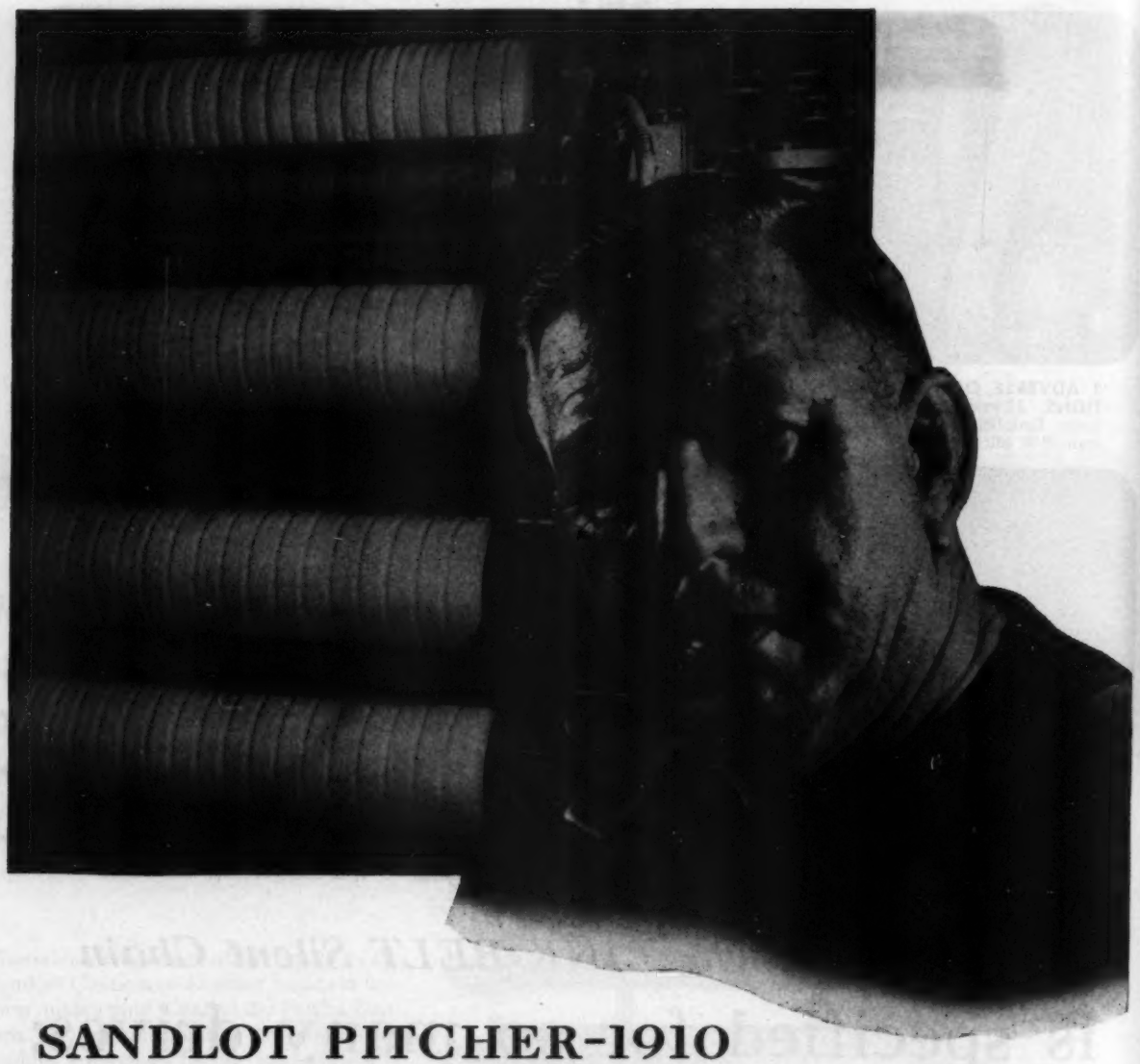

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That's big, amiable Ed Vanderlinden. As a kid he loved baseball, and winter sports, too. Later he hit the trenches with the First Division. And, for more than thirty years now, Ed's vigor and enthusiasm have been devoted to making good felts better. Today he's a specialist in wool carding—a vital operation where the strength of Appleton felts is born.

Ed Vanderlinden is typical of the steady, long-experienced workers at the Appleton Woolen Mills . . . a 73-year-old organization dedicated to development, progress, and the production of ever finer felts—for the finest paper-making.

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high brightness
low moisture
minimum residue
controlled viscosity

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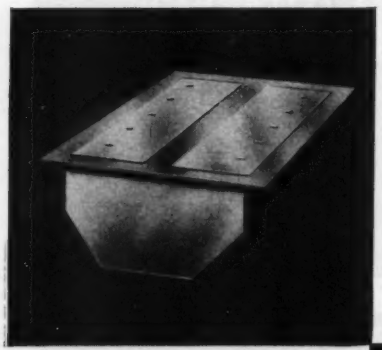
RESULT: Costly machinery repairs and shutdowns.

PREVENTION: Emerson Permanent Magnetic Separation Equipment prevents work stoppages and damage to your vital machines with the proper equipment to remove foreign materials from all stock conveying systems.



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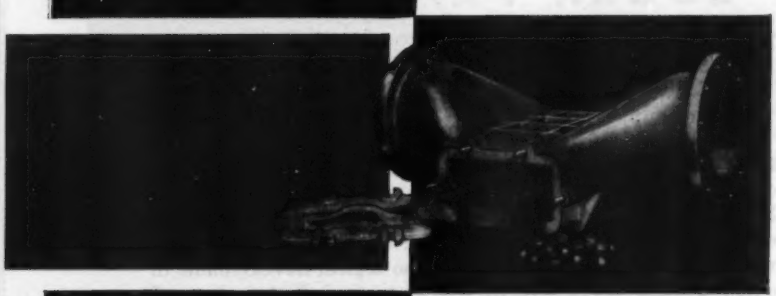
Adaptable for a wide variety of independent installations in pipes, ducts, lines, flow boxes, head boxes, belts, conveyors, troughs or on machines. Three standard types — for moderate, intermediate and extreme junk metal separation requirements. All magnets cast of super-strength Hyflux Alnico V, and completely enclosed in plate housing of non-magnetic stainless steel.



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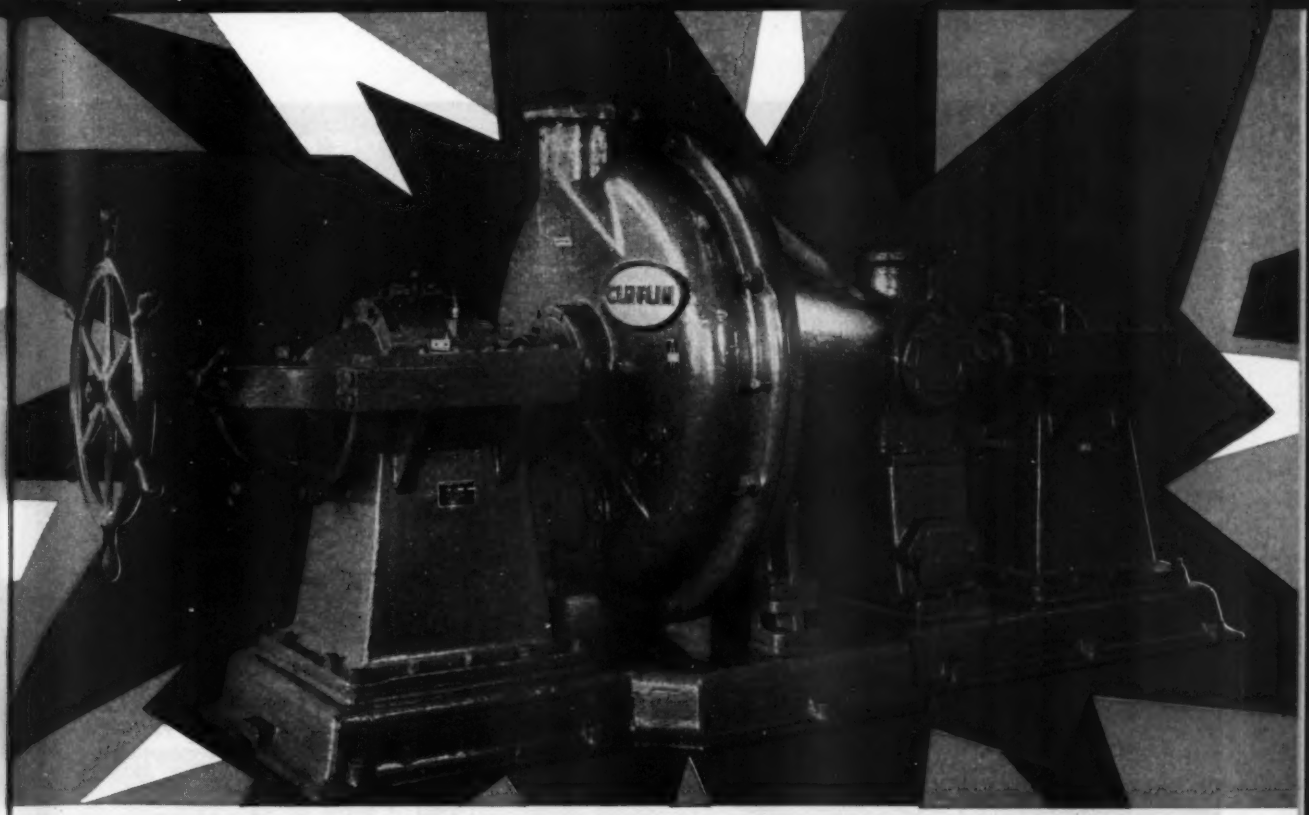

versatility + economy = Emerson Claflins

EMERSON CLAFLINS perform with equal efficiency in primary refining and beating operations on *all types of stock* in both pulp mills and paper mills. With four models available, from the small laboratory unit to the large machine for great tonnage capacity, there's a suitable size for every stock preparation requirement.

EMERSON CLAFLINS spell downright economy in relation to delivered performance in installation, operation and maintenance.

The versatility of CLAFLIN Fillings solves the various stock processing requirements.

Fabricated Shell and Plug Fillings — for clean stock refining. Furnished in one piece with chrome-manganese steel or stainless steel, with or without wood fillers. Bars available in 3/16", 1/4", 3/8", 1/2" and 3/4" widths.

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For extreme hydration — a lava plug and hydrating shell.

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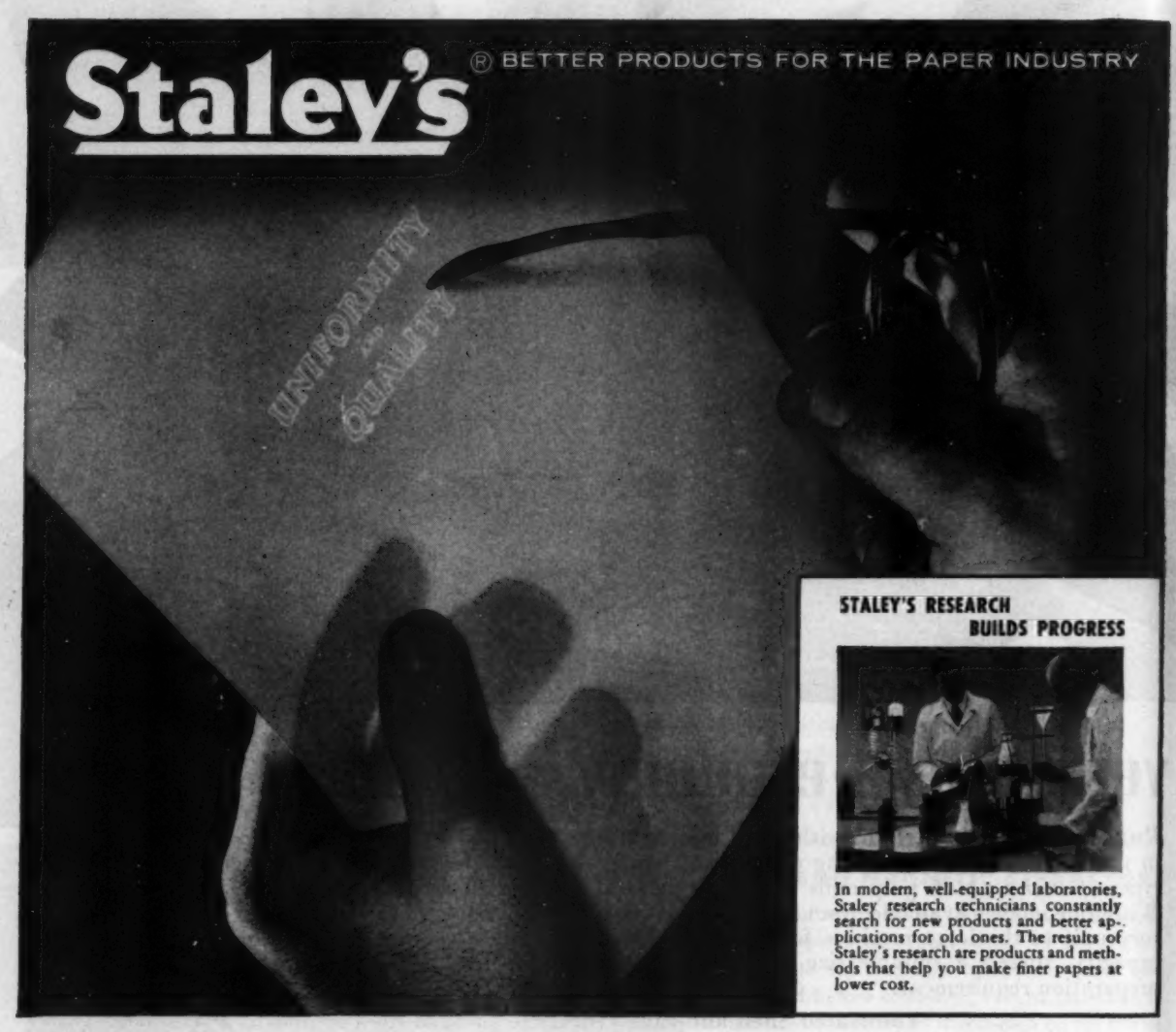

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In modern, well-equipped laboratories, Staley research technicians constantly search for new products and better applications for old ones. The results of Staley's research are products and methods that help you make finer papers at lower cost.

How Staley's sizes up paper problems with solutions that finish in the money!

Staley's custom made starches offer greater production control for higher quality paper products

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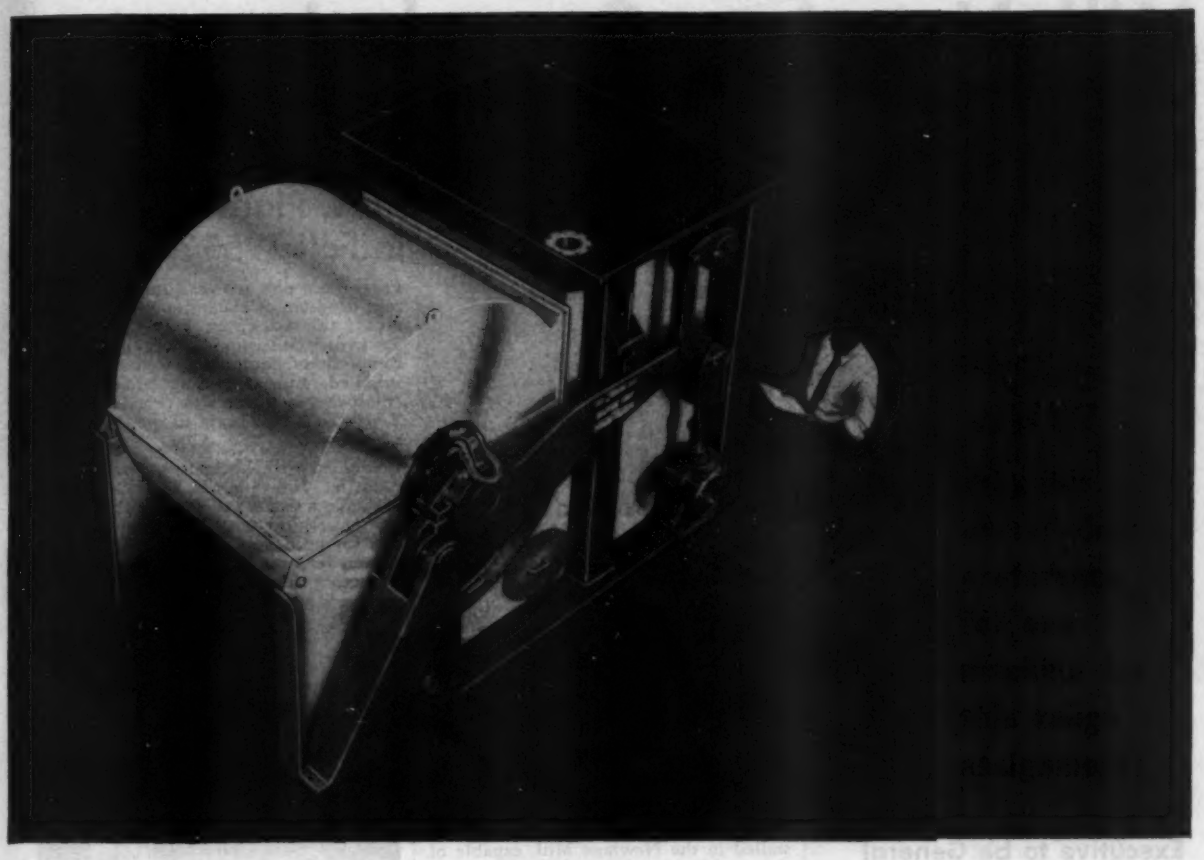


JUST OFF THE PRESS — Write today for your copy of this new Bulletin giving details about the Beating Unit. Ask for Bulletin No. EDJ-1079.

BECAUSE . . .

the Jones Beating Unit has proved, in mill after mill, that it will produce greater uniformity, better transparency, better all 'round characteristics — *at lower power cost.*

A leading glassine mill* writes:

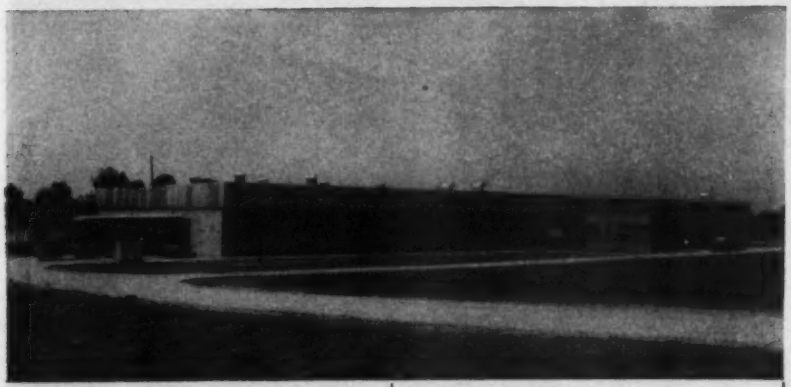
> "Our experience . . . has convinced us that they are capable of producing high grades of glassine...which cannot be duplicated by any other equipment."

Glassine, of course, is only one of many papers on which the Beating Unit has produced such results. Ask your Jones representative how it can serve your needs. *Name upon request

Jones

PROGRESS TENAX FELTS REPORT

Lockport Felt's New Southern Mill Nearing Completion



Mississippi Site Chosen as Central Location to Serve Southern Paper Industry

Starkville, with a population of 7500, home of Mississippi State College, is ideally located in a state which in turn is strategically situated for the purposes of the Lockport Felt Company. Within easy reach for shipping and service are all of the Southern paper mills which now form a vital segment of the country's paper and board manufacturing facilities.

Long-time Lockport Felt Executive to be General Manager of New Plant

A man who began his accumulation of felt-making knowledge 26 years ago in

R. J. Capen

the Weave Room of Lockport's Newfane Mill will be General Manager of the new Southern Plant. Raymond J. Capen's career included experience as Foreman in various departments. More recently he served as Assistant Superintendent and Superintendent.

Mr. Capen, who has been actively associated in the planning and erection of the new mill, will make his home in Starkville with his wife, two sons and daughter.

New Plant to Contain Latest Felt-Making Equipment; Is Air-conditioned

The Lockport Felt Company's nearly-complete Starkville, Mississippi plant has been fitted with the latest and finest equipment in every department. It embodies ultra-modern materials handling facilities, the newest machinery for the weaving, fulling, drying and other operations which are involved in making Tenax Felts. Stainless steel has been widely used throughout. A duplicate of the new drying machine recently installed in the Newfane Mill, capable of drying felts as wide as 320 inches, is a part of the Starkville Plant's equipment.

Air conditioning has been used wherever possible, with the dual purpose of providing greater comfort for workers and making possible closest control of moisture and humidity in yarns and finished felts. The new plant was planned in minute detail to permit the ultimate in production efficiency.

State of Mississippi, Citizens of Starkville, Facilitate Building of New Plant

Lockport Felt Company's decision to establish their Southern mill at Starkville was aided by the teamwork of Starkville city officials, Chamber of Commerce and citizens. In addition, Lockport Felt's choice of the Starkville site was influenced further by the availability of excellent transportation facilities, water and power supplies, and the assurance of a good force of high-calibre workers.

Production of Tenax Felts will become the City's leading industry.

Production of Felts in New Starkville Miss. Plant to Begin in Fall 1955

Focal point of a ten-year, million-dollar-plus program of expansion and development, the Lockport Felt Company's Starkville, Mississippi, plant is nearing completion. Equipment is now being installed, and a training program for employees is under way. Production of Tenax Felts will begin in the latter part of the year.

Combined with Lockport's headquarters plant at Newfane, N. Y., in Western New York State, the new Southern Mill will nearly double the company's capacity for producing the highly-specialized woven felts used in the manufacture of paper and board products.

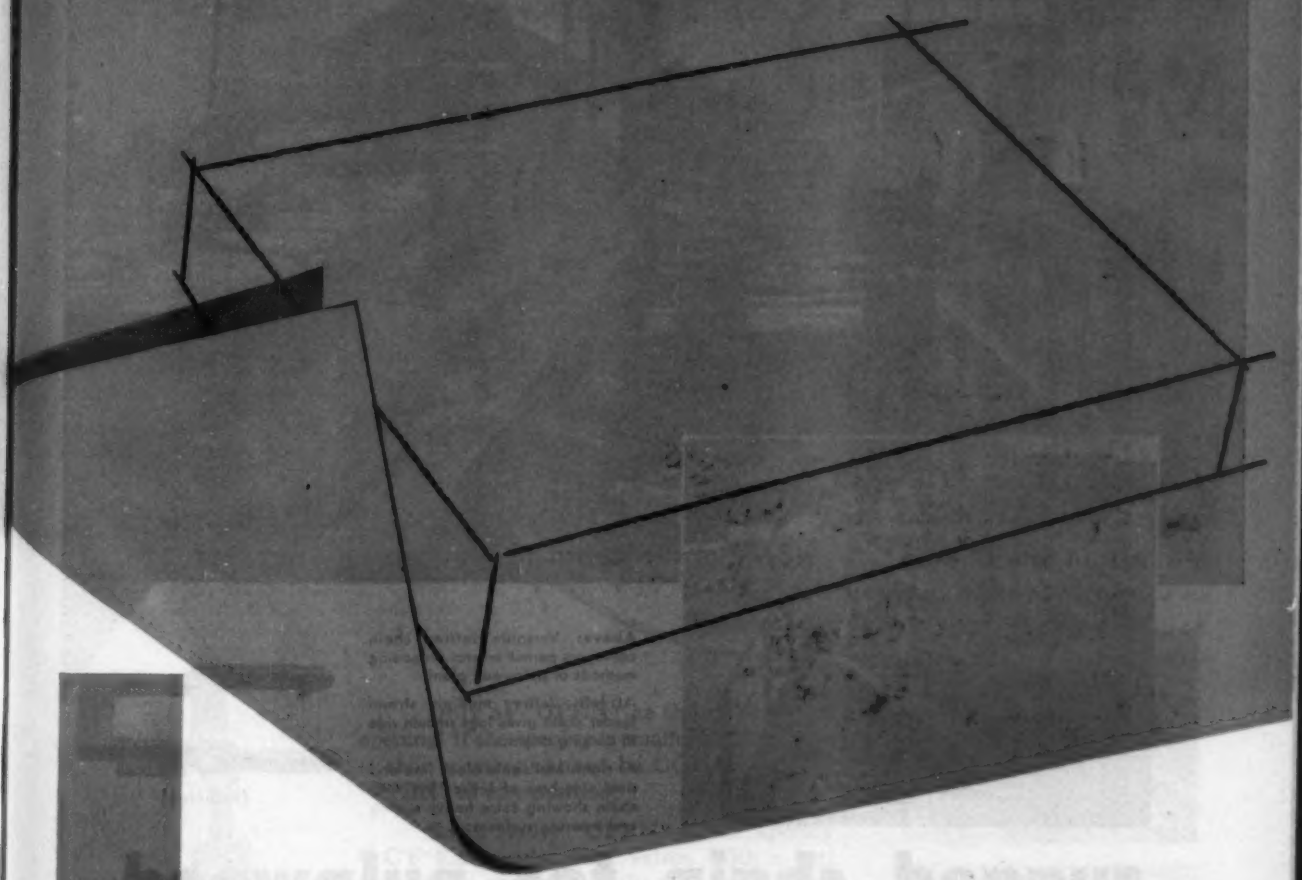
Raymond J. Lee

Lockport's President Describes Starkville Mill as Culmination of Expansion Program

"We are especially proud of our achievement in creating this superb new facility," said Raymond J. Lee, president of the 64-year-old felt-making firm. "Added to our capacity at Newfane, the new Starkville Plant will greatly enhance our ability to serve the rapidly-growing Southern paper industry, making possible faster, more direct and more economical service.

"Nothing has been spared to make this new mill the finest of its kind. It represents the newest and best equipment and design. Matching our progress in completing the Mississippi plant has been our extensive program of improvements at our Newfane Mill. Together, these advancements give us unexcelled facilities for the manufacture of Tenax Felts."

From high-grade bonds to boxboards



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With this non-dusting powder you are assured of minimum two-sidedness. Being a stilbene type, it is not bleachable with chlorine and thus holds interest for use on papers fast to ink eradicators.

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Above: Versatile Jeffrey chain conveyors permit several unloading methods at pulpwood plant.

At left: Jeffrey multiple strand feeder chain gives logs smooth ride to barking drums.

At right: Malleable block link and steel side bars of Jeffrey PW 132 chain showing extra heavy sliding and wearing surfaces.

(Patented)

rugged chain for pulpwood conveying

Pulpwood handling presents special problems of weight, impact and wear. Jeffrey's answer is PW Type Combination Chain—designed especially for this purpose.

Large, flat surfaces on PW's return side enable return strands to slide on runways rather than over idler sprockets. This removes the chief source of wear, both internally and externally. Elimination of return idler sprockets also puts conveyors closer to the ground (note photos). This facilitates loading and saves supporting structure.

All regular Combination Chain attachments fit Jeffrey PW types. Zinc coated pins and riveted assembly available if specified.

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Columbus 16, Ohio

sales offices and distributors in principal cities

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Only as "OPEN" as the valve's port opening! If the opening is smaller than the pipe ...then a valve cannot be COMPLETELY "OPEN" in any position!

For a really "OPEN" flow...specify acf Rectangular Port Valves. With a port opening the same area as the pipe itself... they assure smooth-running, trouble-free operation by keeping down turbulence and harmful abrasive action caused by solids in suspension. They also minimize loss of head pressure...especially important when handling the extra heavy fluids used in the processing industries.

And, of course, all acf *Cylindrical* Lubricated Plug Valves...with rectangular or round port openings... feature "split-second" shut off, TEFLON* head gaskets, and many other design advantages. Representatives in 50 Principal Cities.

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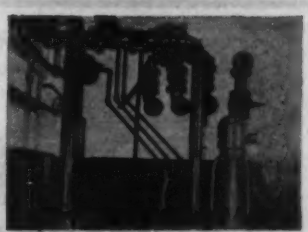

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STANODRIP *Oil whips lubrication problem at Wilson Milk Company*

MANAGEMENT OF THE Wilson Milk Company plant, Sheridan, Indiana, had a serious lubrication problem. STANODRIP Oil solved it.

In overhead bin loaders, hydraulic rams push powdered milk along conveyor chute to weighing machine. Leakage of lubricant from rams on the floor below caused a sanitary and safety problem. Packings were replaced every two months but leakage often recurred as early as two weeks after packing replacement.

Then Mr. Taylor Wiham, Assistant Superintendent, called in John Pirtle, Standard Oil Industrial lubrication specialist. Mr. Wiham asked about STANODRIP Oil and its possible use as a solution to this lubrication problem. Decision was made to convert to STANODRIP Oil No. 29. Old oil was removed, packings replaced and STANODRIP installed.

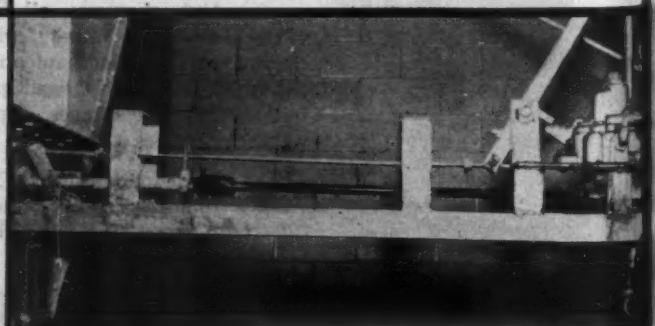
In more than 8 months since installation of STANODRIP Oil, there has been no leakage, no packing replacement. Hydraulic rams are lubricated without oil dripping or creeping.

Maybe STANODRIP Oil can serve you as it has Wilson Milk Company. Find out. In the Midwest, call your nearby Standard Oil lubrication specialist. Or contact Standard Oil Company, 910 South Michigan Avenue, Chicago 80, Illinois.

Taylor Wiham, Wilson Milk Company (right), and John Pirtle, Standard Oil lubrication specialist, inspect oil stain on otherwise spotless floor, the result of previous oil leakage from overhead hydraulic bin loader. Leakage has been eliminated through use of STANODRIP Oil No. 29. Helping customers with lubrication problems is something John Pirtle is well equipped for. John has an engineering degree from Rose Polytechnic Institute, has completed Standard Sales Engineering School and has a number of years of field technical service experience. Customers find this experience and training pay off *for them.*

STANDARD

STANDARD OIL COMPANY
(Indiana)



Three bin loaders like the one shown here dripped oil until converted to STANODRIP. No leaks have occurred in 8 months since. Previously, packings were replaced every two months. Even then leakage often recurred as early as two weeks after repacking.

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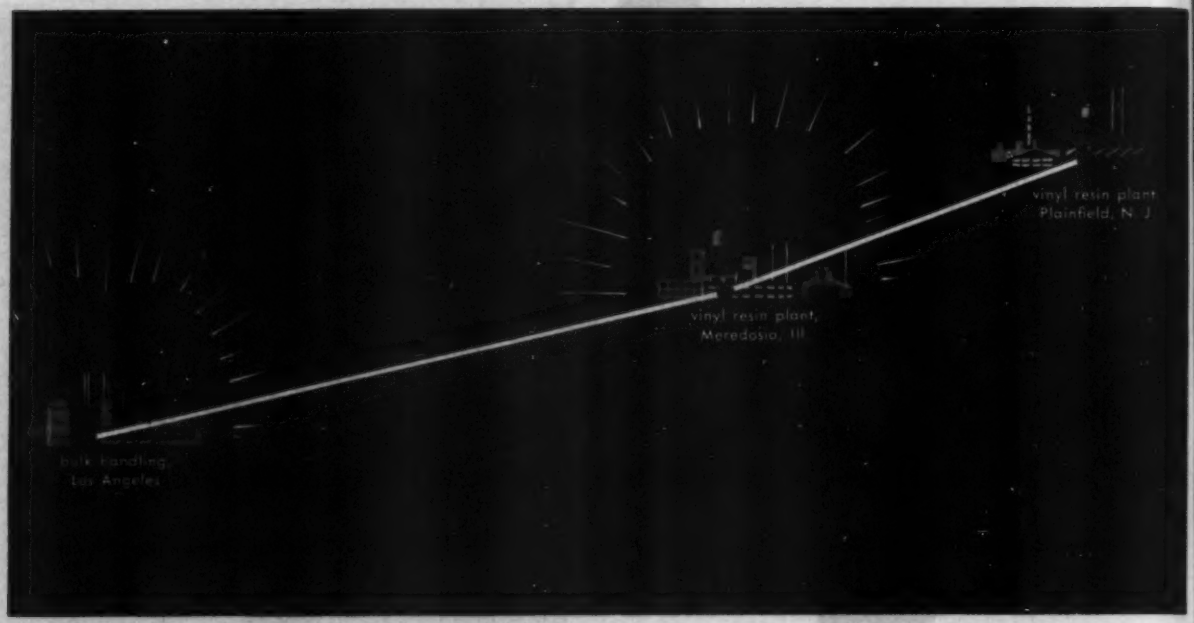
News about National's Vinyl Solutions and Emulsions



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2—*a second vinyl plant at Meredosia, Illinois.*

3—*bulk handling at Los Angeles.*

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Too, deliveries will be faster. From Meredosia, Los Angeles or Plainfield. With all customers enjoying the equivalent of two sources of supply.

Our resin chemists will be happy to supply the details. Just get in touch with your nearest National office.

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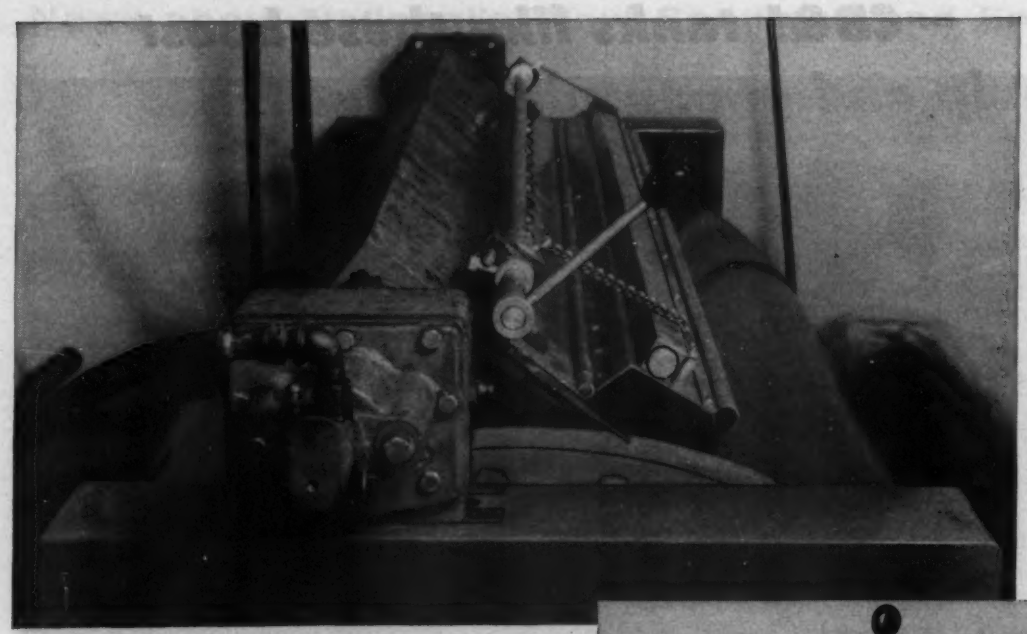
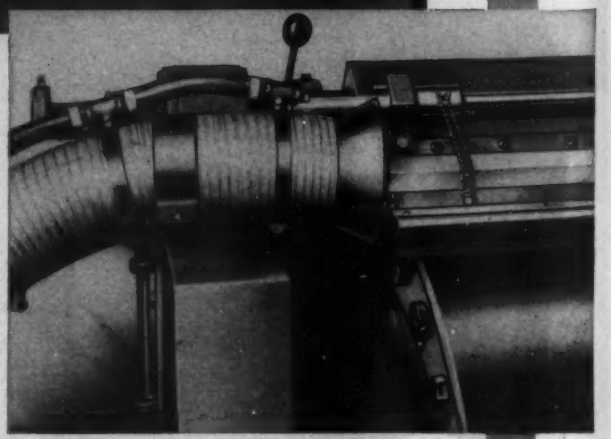


Dryer Doctor with Fuzz Remover installed. (Exhaust Elbow removed to show cross-section). Exhaust Elbow in place, right.



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CURRENT COMMENTS

An end to WOC . . . leaping, not creeping . . . and paper men make news

Does the government want only second-rate men in its service? That is the question raised by Secretary of Commerce Weeks in reply to a Senate committee proposal to end the program under which outstanding men from industry have been called to national service in industrial phases of government operation.

The Senate Banking Committee, controlled by Democrats, has moved to end the program under which outstanding businessmen leave private employment for service without pay in top government posts. They are known as WOC men (Without Compensation) and have been widely used by the Commerce Department's Business and Defense Services Administration. This program was found tremendously valuable in World War II and during the Korean crisis, when rapid expansion of administrative agencies was impossible by ordinary personnel methods.

Industry was called upon to donate its top executives, and 15 of the 25 industry divisions in the Business and Defense Services Administration are now headed by WOC men. In addition, 11 deputy administrators are in this category. The other executive heads are government career men.

Government agents for free

The Senate prohibition, according to Secretary Weeks, would prevent the administration "from using the best men available for these important jobs and would limit the choice in certain cases to persons with second-rate ability, experience and information." He said that from the time these men take up their duties they cease to be industry men and become government agents. They are full-time employees of the government, though serving without pay. In many cases these men have sacrificed income to a devotion to patriotic service. In other cases, undoubtedly, the companies loaning their executives have made certain that men they allow to accept such positions do not suffer financially from their patriotism.

The paper industry has been outstanding in the supplying of such men to the government service. Many have gone into the Commerce Department and in many cases have risen step by step to become division chiefs. The list of paper men who have accepted such positions is long, and for 10 years there has hardly been a time when some paper industry man was not in some high executive capacity under the "Dollar-a-year" man program. The list is long, but to mention only two, G. J. Ticoulat, vice president of Crown Zellerbach, and Russell Flom of Marathon are indicative of the high type of men who have gone from the industry to the government service.

Rubber man in paper

The action of the Senate committee is reminiscent of the World War II days, when the administration apparently took the position that no businessman could be trusted to serve his country in a capacity for which his entire business life had trained him. For instance, an expert from the rubber industry was an important cog in the paper section of the War Production Board.

Never in the history of the country have men of such outstanding prominence in industry been willing to sacrifice their careers to take government jobs. It has been estimated, for instance, that the Secretary of Defense, who sold some $2,000,000 of holdings in General Motors stock to leave the presidency of that corporation, would have been richer by $5,000,000 if he had remained in his industry job and profited by a pending stock split. Practically every member of the Eisenhower cabinet has made comparable sacrifices to serve his country, and the same is true of the lower echelons.

A price spiral

Paper and paperboard prices continue to strengthen. The hike in pay granted in the automotive and steel industries will spiral price rises in other commodities. Creeping inflation is no longer creeping, but leaping. Some economists are wondering if the price picture will not mean inflation to such a degree that the dollar will become worth only 20 cents in purchasing power. The effect on pensions and annuities is not pleasant to contemplate.

Honors where warranted

Two outstanding paper mill names are in the current news. Reuben Robertson Jr., president of Champion Paper & Fibre, has accepted the post of Deputy Secretary of Defense succeeding Robert Anderson as Secretary Wilson's right hand man. He was on the War Production Board in 1942, on the Wage Stabilization Board in 1950 and is a vice chairman of the Business Advisory Council of the Secretary of Commerce. Because of his service as head of a team to evaluate this country's mutual security plan for Germany he was named by the National Association of Manufacturers as the 1953 man of the year. He is first vice president of the American Paper and Pulp Association and normally would eventually succeed to the presidency of the association.

Cola G. Parker is the other outstanding paper man in the news of the month. After a long career in the paper industry, it has been announced that he will probably be elected president of the National Association of Manufacturers at its fall meeting. He is already national vice president. After being named vice president of Kimberly-Clark, he was advanced to the presidency and later to be chairman of the board but retired as of July 1 last. He maintains a personal office only a short distance from the Kimberly-Clark offices at Neenah, Wis. After having been successively vice chairman, chairman and trustee of the National Industrial Conference Board, he has been named to the Canadian Council of the Board. In the paper industry, he is a past president of the American Paper and Pulp Association and is chairman of the Import Committee of the American

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POWELL BRONZE VALVES

FIG. 375—Bronze "White Star" Gate Valve for 200 Pounds W.S.P.

FIG. 2608—Bronze "White Star" Full Flow Globe Valve for 200 Pounds W.P.

FIG. 150—Bronze "Union" Vulcanized Composition Disc Globe Valve for 150 Pounds W.S.P.

FIG. 560—Bronze Regrindable Horizontal Swing Check Valve for 200 Pounds W.S.P.

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Consult your Powell Valve distributor. If none is near you, we'll be pleased to tell you about our complete line, and help solve any flow control problem you may have. Write...

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Current comments . . .

Paper Industry. As an expert in tariff matters, he was named by President Eisenhower as a member of the so-called Randall Commission to formulate a national foreign trade policy and later was named a member of the United States delegation to the GATT conference at Geneva as an advisor to the delegation.

Paper mill corporate changes

Continental-Diamond Fibre Co. has officially become a subsidiary of the Budd Co. Inc. of Philadelphia by the election of a board of directors headed by Edward G. Budd as president. The company will be operated under its old name, but as a wholly-owned Budd subsidiary.

Rayonier Inc. has completed preliminary plans for an insurance company loan of $100,000,000, of which $80,000,000 will be expended in improvement and expansion, the balance to retire outstanding Rayonier preferred stock and some outstanding loans for subsidiary companies.

Stock and Bond Quotations

New York Stock Exchange — Stocks

Closing Prices	July 11, 1955	June 13, 1955
A.P.W.	*5¾-5⅞	4¾
Celotex	32¾	30⅞
Same Pref.	*19⅛-19⅜	19⅛-19¼
Certain-Teed	28	25⅜
Champion P & F	59½	55
Same Pref.	107¼	105½
Chesapeake Corp.	*50-50⅜	47½
Container Corp.	76	*67-67½
Same Pref.	*102¾-104	*105½-109⅜
Crown Zellerbach	79½	78
Same Pref.	*105⅞-106½	106½
Dixie Cup	59	58¾
Eastern Corp.	30½	28⅞
Federal Paper Board	33¼	35
Robert Gair	31¼	29½
Gaylord Container	50⅛	40¾
Great Northern	84	82
Hammermill	32¼	31½
International	108¼	114
Same Pref.	104¼	*103¾-104¼
Kimberly-Clark	52¾	50⅛
MacAndrews & Forbes	*51-52	50¼
Marathon	32¾	33⅛
Masonite	31¾	32¼
Mead Corp.	67	60¾
Same Pref.	*102½-104	*102½-103¾
Same Sec. Pref.	*73-76¾	*66-70
Minnesota & Ontario	68½	68⅞
National Container	21⅞	17¾
Same Pref.	37½	30⅜
Oxford Paper	41¾	44½
Same Pref.	99½	*99-100
Rayonier Inc.	96	90½
Same Pref.	38¾	*37¼-38
Rhinelander	33	34⅝
Scott	71⅞	69
Same $3.40 Pref	*96-97	95
Same $4.00 Pref.	*104-106	*105-107
St. Regis	44	46⅞
Same Pref.	104¾	103
Sutherland	50¼	49
Union Bag & Paper	94½	86¼
United B. & C.	24⅜	*21¼-21½
United Wall Paper	2⅛	1⅞
Same Pref.	...	*17¾-18
U.S. Gypsum	271¼	277
Same Pref.	*181¼-183	*180-182
West Va. P. & P.	48½	45¼
Same Pref.	*108-110	*109-110

New York Stock Exchange — Bonds

Celotex 3¼%	...	...
Champion P & F Co. 3¼%	...	...
Mead Corp. 3%	97	...

American Stock Exchange — Stocks

American Writing	18¾	19⅜
Brown Co. Common	17⅜	17¼
Puget Sound	62¼	...

*Closing Bid and Asked Prices.

OXFORD PAPERS

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The Oxford Paper Co. have long been noted for the quality of their papers. And the finish on these quality papers is all important. To obtain a fine luster, so important to good printing reproduction, Ahco Finish CS is used in the paper coating mix.

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1. Readily pourable — simplifies handling
2. Remains stable in storage—will not harden.
3. Exceptionally fine particle size — over 99% will pass through 325 mesh screen
4. Will not darken or disintegrate on calendering
5. Good dusting control

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When B&W engineers designed this new boiler they turned to their own metallurgical and tubular products experience with alloys for pressure and temperature service to devise the tubing complex that is the heart of the unit. The chart shows the variety of analyses in sizes from 1-inch O.D. to 2½-inch O.D. and wall thicknesses from 0.10-inch to 0.55-inch.

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Milwaukee, Wis: Seamless Welding Fittings

TA-5028(P)

The Paper Industry

AUGUST 1955

To repair or replace?

In this issue we are introducing to the pulp and paper industry a new method of maintenance control proposed by B. A. Margo. The method, as stated by the author, is in line with the modern trend to deal with facts instead of opinions.

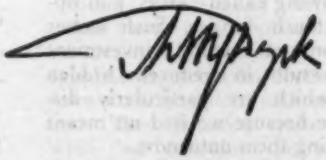
The industry is in urgent need of a method that will eliminate guesswork from an operation where decisions are more often made on the strength of individual opinion that on the basis of precise maintenance requirements. There are relatively few mills that cannot recall case histories where large sums of money were spent on repairs of some major piece of equipment that had long outlasted its useful life. Conversely, in some cases a piece of equipment might have been kept in effective operation much longer, had it not been for an arbitrary decision made under the influence of sudden irritation over a series of repeated performance troubles.

The proposed method is said to do away with all this uncertainty and to provide a yardstick which shows at a glance when maintenance costs of a certain piece of equipment have become so high as to make it obsolete or, on the other hand, when repair expenditures continue to be justified.

The method should give management a new and fascinating insight into maintenance and provide the maintenance engineer with the tools to conduct this operation on a more systematic and scientific basis.

Apart from making decisions regarding replacement easier and relieving the plant engineer of much clerical work, the new method, as pointed out by the author, can (1) save the company large sums of money otherwise spent on ill-advised repairs, (2) lead to better use of capital investment, (3) provide a better balanced replacement program, (4) set schedules for inspections and repairs even for completely new units, and (5) eliminate friction and prolonged arguments which invariably accompany decisions that are based on individual opinion.

The advantages set forth by the author are economically vital and easily recognizable. We have no doubt the industry will put the proposed new method to a thorough test.



A new approach to maintenance control

E. A. MARGO

Consulting Management Engineer

▶ New method detects economic maintenance automatically, provides the means of avoiding large repairs, and facilitates decisions pertaining to replacements

▶ The method is in line with the modern trend to give management facts instead of opinions

THE NEW METHOD of maintenance control described in this article was designed while installing a planned maintenance set-up in a paper mill. One of the problems facing us was, at what intervals should we repeat overhauls? Another problem was how to justify recording of maintenance costs on thousands of history cards. The new method solved these two problems. It puts the whole maintenance organization on a new plane (1) by detecting excessive maintenance automatically and immediately without additional running expense; (2) by giving the means of avoiding large repairs; (3) by making decisions regarding replacements much easier and by giving control figures for a well balanced replacement program.

These advantages should find appeal, even in a mill where maintenance costs are below the average of the industry, because of the complexity of operations and the difficulties confronting top management, operating and maintenance personnel when it comes to the perennial question whether to repair or to replace. The new method provides a measuring stick based on facts which tells when maintenance costs on anything that has to be maintained become excessive, i.e. not only machines and their components, but also mill floors, pipelines, scales, roofs, pavement of roads, trucks and tracks etc. Thus, a great number of arbitrary decisions may be avoided. In a number of instances it is economical to keep certain machines or pieces of equipment (in the following called "units") in operation much longer. Such better utilization of capital investment might result in reduced hidden losses, which are particularly disagreeable because we had no means of detecting them until now.

To run the method does not require any additional help providing the company already employs a clerk who looks after history cards. The new method transforms these cards into an important measuring tool. The installation of the method is a once-occurring effort which is small relative to the permanent benefits derived. To maintain it requires practically no extra work, ability or attention. No calculus is needed.

The basic conceptions behind the method

The method is based on the following three factors:

1. The value of the units to be maintained,
2. The operating conditions under which they work, and
3. the maintenance budget (in the following called "budget").

These factors are taken for the following reasons. With a unit costing $50,000, there is more willingness to spend much more for its maintenance than for a unit costing $500. Similarly, if we have a pump for cold, clear water and one for an acid, we are prepared to spend more for maintenance of the latter. Finally, the only money we normally have at our disposal for maintenance purposes depends upon the budget. To simplify matters we will assume that actual expenses equal the budget. The following picture will show how the budget ties in with the different phases through which the units pass.

maintenance expense shall be reached at the end of the useful life; "useful" in this connection meaning useful from the viewpoint of maintenance only.

The procedure of determining limits in broad terms

We can determine limits for each unit providing we know its value and can define its operating conditions by means of one number. Further, we have to make an assumption regarding the increase of maintenance costs relative to average costs which we want to tolerate at the limit. For defining operating conditions we can use a Table of Wear Points. (Table I). The total of Wear Points per unit is called Wear Factor. This is the number mentioned. After calculating an average Wear Factor for all units of the mill, divide each individual Wear Factor by the average Wear Factor, which gives Wear Ratios. These are numbers which tell us whether the individual unit is subject to more or less wear than the average unit.

Using arbitrary figures, we can say that we have at our disposal

$$\frac{\text{monthly budget}}{\text{total investment}} = \frac{\$\ 2{,}500}{\$500{,}000} = \$.005/\text{month for}$$

LIFE OF UNITS					
new	up to average	average	over average	end of useful life	should have have been replaced
small	up to average	average	over average	"LIMIT"	excessive
BUDGET					

The second line shows these phases, the third one the corresponding maintenance expense. Now, we can say that the "Limit" of tolerable maintaining a unit costing $1. If we decide to set the limit at double the average expense, we obtain .01 dollars/month, which is a constant

for all units. We may go higher or lower as we see fit, or vary this constant to accelerate or decelerate the replacement program in a general manner. And now we are ready to calculate limits. (Table II).

Table II shows 10 units representing a total investment of $500,000. Wear Factors have been taken at random. The total of all Wear Factors (336) divided by 10 gives us the average Wear Factor, 33.6. If we divide e.g. the Wear Factor 13 of unit No. 10 by this figure, we find the Wear Ratio .39.

The Wear Factor 13 for this unit may be calculated as follows. We select from Table I the following Wear Points

Reference No.	Wear Points
1-1	1.2
2-3	2.4
3-2	2.0
4-3	1.6
17-3	1.4

and multiply them with each other thus:

$1.2 \times 2.4 \times 2.0 \times 1.6 \times 1.4 =$ 12.9, or Wear Factor 13.

Then the limit may be calculated thus:

$\$22{,}000 \times .01 \times .39 = \$86$/month, where .01 represents our constant and .39 the Wear Ratio.

This example has not been prepared for any specific unit to avoid a misconception. Budgets, total investment and average operating conditions vary from mill to mill. Consequently, the Wear Ratios and Limits of a drum barker or mill floor in one mill will be different from those in another mill. However, it may be expected that eventually there will be tables which will facilitate the determining of Wear Points in the pulp and paper industry. Such tables will show the influence of various operating conditions upon the wear of materials used in construction of the units commonly used in this industry. Consequently, there will exist a uniform basis for the whole industry which will also facilitate comparisons of Wear Factors and Limits from mill to mill.

This quick run through the whole procedure of calculating limits will familiarize the reader with the terminology used and give him confidence in the simplicity of the method. Now, we will discuss details of the procedure and various ramifications.

Table II

Unit No.	Value $	Wear Factor	Wear Ratio	Monthly Limit
1	17,500	4	.12	21
2	23,500	25	.74	174
3	45,000	17	.51	230
4	96,000	49	1.46	1,400
5	105,000	65	1.93	2,025
6	67,500	28	.83	560
7	48,000	36	1.07	513
8	65,000	55	1.64	1,066
9	10,500	44	1.31	138
10	22,000	13	.39	86
Total	500,000	336		6,213
	Average	33.6		

Table III

Year	Index No.	Conversion Factor	Year	Index No.	Conversion Factor
1935	98.1	1.96	1945	128.6	1.49
36	99.1	1.94	46	139.5	1.38
37	102.7	1.87	47	159.6	1.20
38	100.8	1.90	48	171.9	1.12
39	99.4	1.94	49	170.2	1.13
40	100.2	1.91	50	171.9	1.12
41	105.2	1.82	51	185.6	1.04
42	116.6	1.65	52	189.8	1.01
43	123.7	1.55	53	191.3	1.00
44	125.7	1.53	54	192.1	1.00
*estimated		*			

Example: a unit costing $100 in 1944 might cost about $1.53 \times 100 = \$150$ today.

Note: the Index numbers are taken from the Consumers' Price Index as published by the Bureau of Labor Statistics, based on 1935 — 39 = 100.

Table I—Wear Points

Operating Condition	Item No.	DEGREES			
Usage	1	1 shift 1-1 1.2	2 shifts 1-2 2.6	3 shifts 1-3 4.0	
Load	2	constant 2-1 1.2	slight fluct. 2-2 1.7	cont. fluct. 2-3 2.4	repeated shocks 2-4 3.6
Vibration	3	none 3-1 1.0	slight 3-2 2.0	medium 3-3 3.0	severe 3-4 4.0
Head or Pressure, Stress	4	small 4-1 1.1	medium 4-2 1.3	high 4-3 1.6	
Capacity	5	1,000 G.P.M. 5-1 1.2	5,000 G.P.M. 5-2 1.4	10,000 G.P.M. 5-3 1.6	
Cavitation	6	none 6-1 1.0	slight 6-2 1.3	medium 6-3 1.7	severe 6-4 2.2
Corrosion	7	none 7-1 1.0	small 7-2 2.0	medium 7-3 4.0	severe 7-4 8.0
Abrasive content, Abrasion	8	none 8-1 1.0	small 8-2 1.2	medium 8-3 1.4	high 8-4 1.7
Temperature Degrees F.	9	9-1	9-2	9-3	9-4
Temperature fluctuation	10	negligible 10-1 1.0	gradual 10-2 1.3	sudden 10-3 2.5	
Velocity	11	small 11-1 1.1	medium 11-2 1.2	high 11-3 1.3	
Erosion	12	none 12-1 1.0	small 12-2 1.1	medium 12-3 1.5	high 12-4 2.0
Use outdoors	13	summer 13-1 1.2	winter 13-2 1.4		
Sileage	14	low 14-1	medium 14-2	high 14-3	
Treatment by oper. Personnel	15	good 15-1 1.0	bad 15-2 1.5		
Unsuitable Mat. used in Unit	16	16-1 2.0			
Importance of Unit	17	non-critical 17-1 1.0	semi-critical 17-2 1.2	critical 17-3 1.4	

Note: it is advisable to define expressions as "small", "medium" etc. by means of concrete data wherever feasible and to collect such data in manual.

First a few words about values

Possibly each mill has an equipment register showing purchase prices. For the units bought during the last few years, these prices may serve the purpose. For units bought several years ago, these prices should be adjusted to suit the purchasing power of the dollar of today. Otherwise, the data will not be consistent. In the absence of something better, the conversion factors shown in Table III may be of some value.

Book values and replacement values are not applicable. Book values are calculated to suit the regulations of tax authorities which have no connection with our problem. This becomes quite evident when we consider the numerous units which are completely written off but still in good working con-

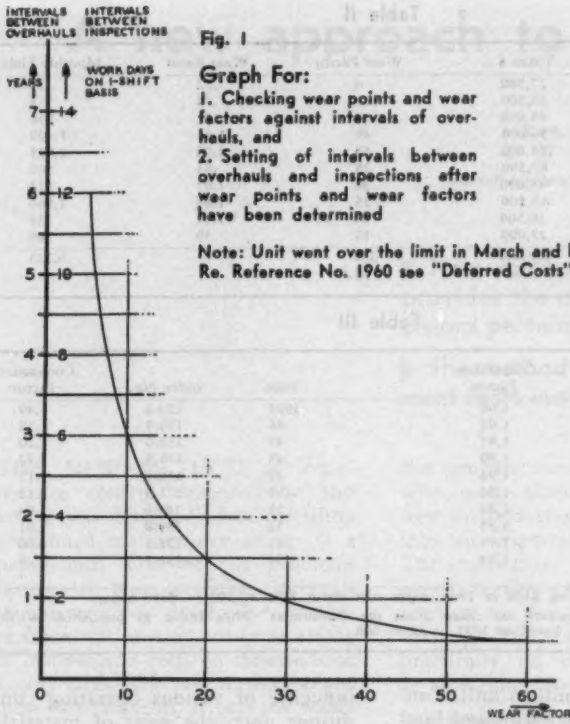


Fig. 1

Graph For:

1. Checking wear points and wear factors against intervals of overhauls, and
2. Setting of intervals between overhauls and inspections after wear points and wear factors have been determined

Note: Unit went over the limit in March and had to be discarded Re. Reference No. 1960 see "Deferred Costs" form on following page

dition and costing tolerable maintenance costs. Such units cannot be neglected as far as calculation of limits is concerned.

Replacement values are not applicable, which is fortunate since they would require continuous, cumbersome adjustments. We are only concerned with the values of units at original laid down cost brought up-to-date to suit the fluctuating dollar. This adjustment is needed once only at the start.

For numerous units, as components of paper machines, prices may not be immediately available. Some may have to be obtained from suppliers, others may have to be estimated.

Explanations of the Table of Wear Points

Table I is a specimen only, with arbitrary point values. For the requirements of any mills these may have to be enlarged, perhaps including overload and various other types of corrosion. Item No. 17, Importance of Unit, was included for the following reason. There may be certain units, a breakdown of which will cause an immediate loss of production. They are called critical. Others may cause a loss of production after a breakdown lasting for several hours. They are called semi-critical. It is conceivable that such units be given a higher priority and that more money must be spent in maintaining them. For these reasons it may be desired to raise their limits to the extent indicated by Item No. 17-2 and 17-3.

How to determine wear points

Wear Points may be established by plain guess work; using the judgment of good maintenance men; information contained in literature; laboratory tests; reliable maintenance records, or a combination of all these means. The reliability of Wear Points may be checked by means of a graph as per specimen (Fig. 1). This graph is based on the observation that there exists normally a relation between operating conditions as expressed by Wear Factors and intervals between overhauls. A unit with Wear Factor 60 may require an overhaul once every six months. Consequently, a unit subject to half the wear (Wear Factor 30) should require an overhaul once a year only. It is advisable to draw up this graph as soon as possible when you start setting Wear Points. To this end it is only necessary to locate the unit subject to greatest wear. Since the intervals between overhauls of this unit should be known, the point farthest to the right of the curve may be determined. To extend it to the left is easy.

Wear Factors and intervals between overhauls of all units should fit into this graph in close limits. As soon as this fact has been established, the graph may also be used to set intervals between inspections. In addition, it should be of great value whenever a unit of a kind never before used has to be installed. Knowing its operating conditions and consequently its Wear Factor, the intervals between inspections and overhauls shown on the graph should help to run the unit with a

MONTH 1954/5	REF. NO.	LABOR $	MATERIAL $	TOTAL $	MONTH 195—	REF. NO.	LABOR $	MATERIAL $	TOTAL $
DEC.	1839	110	55	165					
JAN.	1925	15	40	55					
JAN.	1960			60					
JAN.				115					
F.E.B.	2010	45	160	205					
F.E.B.	1960			60					
F.E.B.				265					
MARCH	2555	185	260	445					
MARCH	1960			60					
MARCH				505					
SPEED REDUCER					DEPT. 564		LIMIT $300	EQUIP. NO. 985	

Fig. 2—Specimen form showing monthly repair costs

small risk of damage and small maintenance expense.

For pumps, electric motors or other units operating under similar conditions per type, the Wear Factor has to be calculated once per type only, not per unit, although the limit should be marked on each history card.

The new reporting set-up and its advantages

The limits marked on history cards will function as an insurance that excessive maintenance costs will come to light immediately. This possibility to take immediate action is in marked contrast to the normally experienced delays which are caused by the fact that the plant engineer can scan history cards only in rotation. Even if he gives preference to history cards of important units, he will not be able to compete with the new set-up as far as speed and reliability of judgment is concerned. Consequently, excessive maintenance costs may be stopped much earlier.

However, you may now also prevent large repairs altogether in a systematic manner. If a unit requires a large repair, the plant engineer would be well advised to check the history card first to find out if this repair would bring the unit over the limit. If so, and providing sufficient time is available, he could bring the situation immediately to the attention of the proper authority in charge of replacements. Thus, it might frequently be possible to avoid such large repairs which, from all indications, would be a waste of money.

It stands to reason that any large repair might bring any unit over the limit if its cost were dumped into the month when the expense occurred. This should be avoided according to normal cost accounting practice. Costs of large repairs should be spread over a period of months according to their expected effect. These specimen forms show the principle of the procedure. (See Figs. 2 and 3).

The new reporting set-up would split work and responsibilities in a logical and efficient manner:

1. The posting clerk would observe without extra effort if maintenance costs went over the limit; he would report his observation to the plant engineer.
2. The plant engineer would investigate whether the increase is incidental (perhaps caused by lack of proper spare parts) or permanent. If it is permanent, he would report the facts to
3. the executives in question, who would check the book value of the unit and other pertinent facts. Then they would recommend an immediate or postponed replacement.

Limits — obsoleteness — replacement program — budget

If we call a unit which went permanently over the limit obsolete from the viewpoint of maintenance costs, you may now obtain valuable control figures for measuring obsoleteness and its effect upon the replacement program as well as the budget. After earmarking the history cards of obsolete units, the following data may be obtained:

	No. of Units	% of Total	Condition	Monthly Maint. Cost $	% of Total	Average $/Unit
	276	33	obsolete	37,300	45	135
	559	67	good	46,033	55	82
Total	835	100	mixed	83,333	100	100

The extra cost of carrying the obsolete units would amount to 276 × $53 = $14,600 per month or 17.5 per cent of the total monthly expense ($83,333), where $53 is the difference between $135 and $82. If comparisons of these data at regular intervals indicate a trend in one or the other direction, you would be in a much better position than ever before to substantiate e.g. the need for more replacements or adjustments of the budget. Such data may be prepared for all units together, per group of similar units and/or per department. Obsoleteness per department might be a valuable measuring stick for an incentive system for supervisors.

When to change limits?

Even to change a few thousand limits takes several hours only. To change them should be necessary only

1. whenever operating conditions of a unit, group of units or of all units change substantially and permanently;
2. if the budget has been changed substantially and permanently

(Continued on page 434)

PROGRESSIVE PAPER MILLS
DEFERRED COSTS

REFERENCE NO. 1960 EQUIPMENT NO. 985

Broken shaft

LABOR $ 125 MAT $ 475 TOTAL $ 600 MONTHS 10

MONTH 1955	AMOUNT CHARGED $	BALANCE $	MONTH 195_	AMOUNT CHARGED $	BALANCE $
JAN.	60	540			
FEB.	60	480			
MARCH	60	420			

Fig. 3—Specimen form showing deferred repair costs

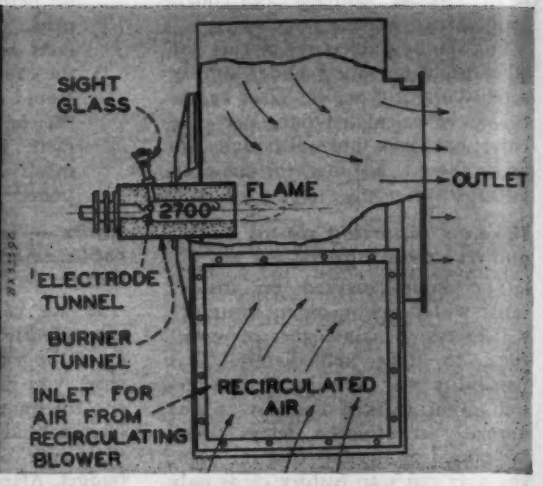


Fig. 1 (left)—"Surface" scroll-type gas-fired air heaters located on one side of the tunnels and manifolded to three of the tunnels. Note burner located in center of side of scroll and overhead ducted manifold for heated air outlet to tunnels. Fig. 2 (right)—Cross section of scroll-type air heater showing arrangement of components. The inlet connection is tangential to the casing outer contour. The outlet, in the center, discharges horizontally at right angles to the inlet

Gas heat for drying coated paper saves $20,000 per year

H. E. RUSSELL*

▶ By substituting direct gas-fired air heaters for steam coils as a heat source, Miami Valley Coated Paper Co. has been able to reduce over-all drying costs by $20,000 annually — at the same time improving product quality and reducing rejects

THE DRYING OF COATED printing papers, used in the high quality graphic arts industry, is a very critical operation. The correct temperature must be maintained at all times to insure uniform drying over the entire surface of the paper. This is an absolute necessity in order to provide the optimum printing surface. The coating process comprises the application of a mixture of dyes in china clay, usually with a casein base to the surface of printing stock, bond paper, postcard, and index stock and other specialty papers.

The most widely used method for drying this coating has been by hot air from a steam coil heat exchanger,

*The Cincinnati Gas & Electric Co.

Fig. 3 (left)—Profusion of steam pipes and connections required for the former steam heat method for drying the paper after coating. Fig. 4 (right)—Arrangement of steam pipes under drying tunnel. Paper strip traveled over these pipes while drying

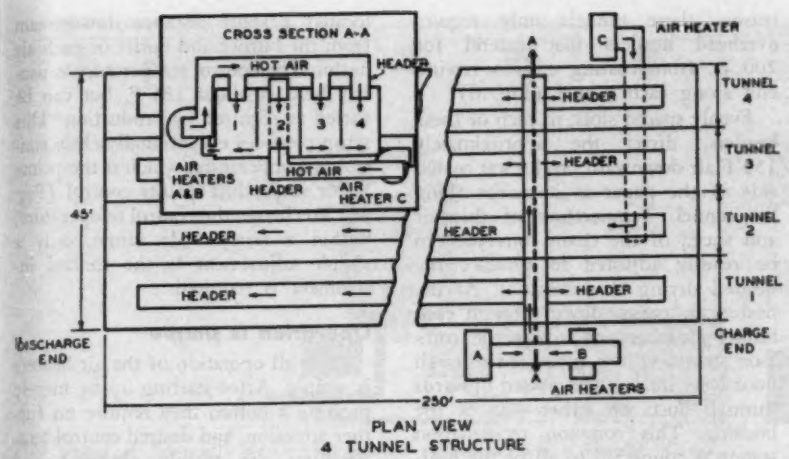


Fig. 5—Plan and cross section view of common housing and the four separate tunnels. Tunnels 1, 3 and 4 are fed by air heaters A and B. Tunnel 2, which is used for double-coated paper only, is fed by air heater C

steam being supplied by a central steam plant. This system requires considerable manpower and equipment, plus floor space for such things as heating plant, piping and fuel storage, all of which are costly.

As part of a recent over-all equipment and procedures modernization program at Miami Valley Coated Paper Co., Franklin, Ohio, it was decided to convert to gas heat wherever practical for all plant processing and space heating. The first and most notable changeover in this program was the switch from steam to gas heat for drying the paper coating.

Steam method costly

The profusion of pipes and fittings required for the steam method previously used is shown in Figs. 3 and 4. Considerable floor space was required for boilers, fuel, and spare parts storage. In addition, most of the piping had to be installed under the floor between the boilers and the drying tunnels. These areas had to be adequately protected for foot traffic. Since the plant operated on a 24-hour basis, the boilers also had to be operated 24 hours a day, and it was also necessary to have three shifts of licensed firemen.

Gas-fired air heaters installed

Three direct gas-fired air heaters were installed directly adjacent to the battery of four drying tunnels and connected to them by common ducts crossing over and along the bottom of the tunnels (Fig. 1). With two air heaters on one side and one on the other, all four tunnels are now fed uniformly-heated air through two separate recirculating systems. The accumulated output of all three air heaters is about 185,000 cfm.

These air heaters are of the scroll-type design and were built by Surface Combustion Corp., Toledo, Ohio. They are standard-rated, package units that operate on low-pressure natural gas and combustion air at 1-lb. pressure, from air compressors. They are also operated "push through", in this tunnel drying system, with the recirculating fan discharging into the heater inlet.

The heated air outlet in each of these scroll type air heaters is located in the center of the casing and discharges horizontally at right angles to the inlet (Fig. 2). When incorporated with a scroll-type circulating fan, this type of design requires less space for the same output compared to the conventional design of air heater.

Four tunnels in a common housing

All drying of coated paper stock is carried out in a battery of four tunnels which are housed in a common structure. The individual tunnels are sepa-

Fig. 6—Overhead 200-ft. header used in tunnels 1, 3 and 4. Note evenly spaced slots for directing heated air downward on top of the wet-coated side of the paper

Fig. 7—Floor-level heating air inlets in tunnel 2 for drying the bottom side of the special paper that requires a coating on both sides

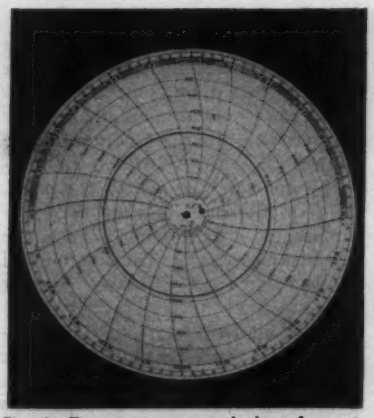


Fig. 8—Temperature control chart from air heater C shows the remarkable uniformity of temperature maintained

rated by removable screens or partitions which can be changed as required by production demands.

The common housing is over 250 ft. long, from charge end to discharge end, and about 45 ft. wide. The paper is processed in rolls, unwound at the coating end and rolled up again at the drying end. The liquid coating is applied to the paper by rolls at the unwind end. In traveling the length of each tunnel the unrolled continuous sheet of paper drapes down in loops, each about 6 ft. deep, from hanger rolls that are moved by overhead continuous chains. These double chains form a complete loop system that returns the empty hangers along the floor (Fig. 5).

Tunnels 1, 3 and 4 are used for processing paper that is coated on only one side and requires a blast of hot air from only one direction. For this reason, these tunnels only require overhead headers that extend for 200 ft. from coating end to rewind end along each tunnel (Fig. 6).

Evenly spaced slots, in each of these headers, direct the approximately 150°F air downward on the wet coated side of the paper as it moves along the tunnel. Temperature of this air and speed of the chain conveyor can be readily adjusted to produce the desired drying characteristics. As the heated air passes down through each tunnel chamber and across the common structure, it is exhausted through floor level intakes and passed upwards through ducts on either side of the housing. This common recirculation system is connected to all of the heaters. The recirculating system also mixes controlled amounts of outside air, as required. Air heaters A and B, which are manifolded to tunnels 1, 3 and 4 have an accumulated output of 125,000 cfm.

Tunnel 2, which is used exclusively for the papers that are coated on both sides, is connected to air heater C. To completely dry both sides, the first 40 ft. of this tunnel are equipped with an additional bank of floor-level hot air inlets which are evenly spaced to blast heated air upward against the bottom of the wet paper as it makes a straight run over these outlets (Fig. 7). After passing over the jets of hot air, the paper is looped in the same manner as the single coated paper in the other tunnels to pass under the overhead jets. Air heater C has an output of 60,000 cfm of 150°F air.

To insure accurate control of temperature, a control thermocouple is located a short distance downstream from the burner and outlet of each air heater. The control temperature is usually held at about 185°F, but can be varied as required by production. This setup provides exceptionally close control of temperature, which is the prime factor in product quality control (Fig. 8). To change the control temperature, within a fairly wide range, only a simple adjustment to the control instrument is required.

Operation is simple

Over-all operation of the air heaters is simple. After starting up by merely pushing a button they require no further attention, and desired control temperatures are readily obtained and accurately maintained by simple adjustment. With the old steam system, considerable time was required to build up pressure after starting up, and any changes in desired temperature were achieved by lowering or raising this pressure, a very inefficient method.

Operation of the air heaters is safeguarded by the use of electric ignition and a constant burning pilot on the burners. Automatic safeguard units also protect the heating equipment and the entire system against fire and explosion hazards through inadvertent utility failures in the air heaters.

By replacing the steam method with gas heat, two 250-hp boilers were eliminated along with maintenance, fuel storage, floor space, and other added problems. The result has been a yearly savings of $20,000 plus the added advantage of better working conditions, increased production and better control of product.

Maintenance Control

(Continued from page 431)

but independently of changes of the purchasing power of the dollar.

Fluctuations in purchasing power of the dollar should not necessitate changes of limits for the following reason. Limits are calculated using the quotient Budget divided by Investment (in our example $2,500/$500,000). If the Budget has to be changed because of changing purchasing power of the dollar, you may assume that the dollar value of the investment figure would change approximately to the same extent. Consequently, the ratio should remain about the same.

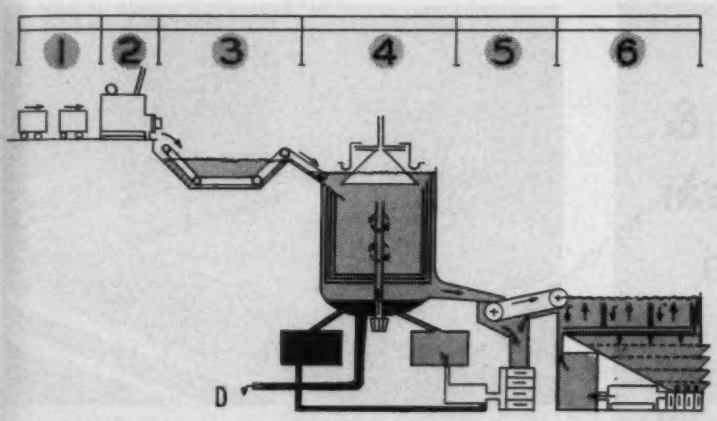
It may have been noticed that the total limits ($6.213) shown in Table 2 is larger than double the monthly budget (2 × $2,500) which may seem to be a contradiction to our basic decision that the limit should be reached at double the average maintenance cost. The calculations may show the total limits to be larger or smaller than double the monthly budget. It would be a coincidence if they were identical. This is of no practical consequence for it is impossible that all units reach their limits simultaneously. Besides, the meaning of the two figures is different. The Limits show when to stop spending while the Budget shows what to spend.

Conclusion

The new method outlined above may help

1. to save money by avoiding unadvised repairs,
2. to utilize capital investment to better advantage by keeping certain units in operation longer,
3. to run a better balanced replacement program,
4. to make quicker adjustments of the budget,
5. to set schedules for inspections and repairs even for new units,
6. to relieve the plant engineer of a great amount of clerical work,
7. to make decisions regarding replacements easier,
8. to reduce the danger of friction and heated arguments.

The installation is a fascinating task for an ambitious maintenance man, comparable to the exploration of a new territory with a wide horizon. This is in line with our modern trend to give management facts instead of opinions and to replace occasional discoveries with systematic daily routines.



Filter elements for water, designed to keep the requirements for water at a low level.

Water reservoirs within the machine set designed to have water stored for sudden need.

Disposal pipe system for unprocessable paper quantities (about 3% of all known papers).

Tank containing water mixed with foreign particles from major disintegrator; (will be cleaned regularly).

The stages of the waste paper regeneration method of Georg Eineder, Vienna, Austria, are shown above in basic outlay

New Austrian waste paper recovery method

F. H. BAER

THE DISINTEGRATION OF all chemical and physical elements contained in any type of waste paper, with their simultaneous elimination, except for cellulose fibers, is the basic principle of a new waste paper recovery method developed in Vienna by Georg Eineder. He claims that, following his method, all cellulose fibers leave the disintegration process without chemical or mechanical damage to the individual cellulose fiber, rendering these fibers fully as good as those obtained directly from pulpwood.

The basic principle of the Eineder method is the swelling of the paper. The fibers swell evenly, quickly and completely, and all chemical and other foreign particles around the fibers are loosened.

Not all fibers swell evenly, expansion depending on the freshness of the cellulose fiber (contained in the waste paper), the number of times it has been used before, and the structure of the particles around the fiber. Where large amounts of glue or resins are used, the swelling takes much longer, occurring only after the layer of resin or glue has been softened. If paper is treated with water-repellent chemicals, no swelling whatever is possible.

Some waste paper recovery methods employ steam under high pressure, turbulence within containers, or action of strong chemicals to produce swelling. In each case, the cellulose fibers are damaged either in their physical or chemical structure. With all methods known, paper is first put in a water bath for softening. Wherever newspapers, magazines, or other closely baled paper, are dumped into such a bath, only the top and bottom sheets and the paper edges are wetted, leaving the remainder dry.

The Eineder Process

In the Eineder method, the paper is dumped into an air-tight container. Vacuum pumps are empoyed to reduce the air within the steel container to a certain minimum. A liquid charge is then injected. In the absence of air, the liquid penetrates and wets the paper mass completely and evenly. The injected liquid consists of water mixed with certain sparingly-used chemicals, three in all, each designed to do a specific job in softening, swelling, and pre-disintegration.

The paper in such a container, be it books, magazines, waxed paper, or parchment quality, is evenly wetted and — during the twenty minutes of swelling time found practical — all types are brought to an equal degree of swelling.

After that, the wet paper is transported to the next machine via water-flooded conveyor belts. In the main disintegrator, a vertical shaft is fitted with agitators.

The foreign particles within the paper material, already loosened in the vacuum container, are shaken off from the cellulose fibers. Due to the differing specific weights and different volumetric sizes of the fibers, compared to the foreign particles, the water carries the fibers to a cleaning machine, while the foreign particles such as glue, resin or printing inks are drained into a disposal pipe system.

Since many cellulose fibers still cling to each other (due to the felting of the fibers at the time of paper production), these non-separated fibers are transferred to a micro-disintegrator. There, in about 12 stages of increasing intensity, the fiber agglomerates are separated and the last traces of foreign particles removed.

The last step is the dehydration of the wet cellulose fiber mash, the grading of fibers, and, finally, the compression of the dry fibers, either in sacks or in rolls, for immediate shipment to the paper mills which can add these fibers directly to the wood pulp used in papermaking.

Simple machines and little power needed

The Eineder waste paper recovery method, described by the inventor as a completely new concept in this field, operates at a speed of 12 to 32 ft. per second (i.e., the flow of the wet substance) at a temperature ranging from 68°F to 86°F, and uses chemicals at a rate of 0.5 per cent of the processed volume. The operation results in the recovery of both fiber and kaolin. This kaolin can be mixed with the cellulose fibers at the last step of processing,

(Continued on page 465)

West Virginia Pulp & Paper Co.'s five-year expansion program

Largest single box factory in North America, the Etobicoke plant in Toronto, which was opened in May 1955 by West Virginia P & P's subsidiary, Hinde & Dauch Paper Co. of Canada Ltd.

ONE OF THE LARGEST producers in the industry, West Virginia Pulp & Paper Co., announced in February a five-year program of expansion involving an investment of more than $100 million.

The motivation behind this expansion is the conviction of David L. Luke Jr., president, that the "basic position of the American pulp and paper industry is far stronger than it ever was before."

Major projects in the plan include the purchase of two new modern high-speed fourdrinier machines, with supporting equipment, costing around $25 million; and the construction of a new pulp and paper mill in the Appalachian area, costing around $30 million.

New paper machine at Charleston

One of the new machines will be installed at the company's Charleston, S. C., plant and will be designed to produce both kraft paper and paperboard. It is expected to be brought into production late in 1957 and, with supporting equipment, will cost close to $15 million.

This machine will add around 450 to 500 tons a day to the plant's present production of 950 tons. Currently, the Charleston mill — the company's newest, built in 1937 — operates with two recently rebuilt paper machines, having operative widths of 242 and 246 in. The No. 1 machine makes linerboard and the No. 2 machine kraft paper. The new machine will be about the same size, with productive capacity equivalent to that of the older ones.

New machine at Luke

The second new machine will be installed in the company's mill at Luke, Md., which now has a daily capacity of 350 tons of white printing and converting papers made on seven recently rebuilt machines. With the addition of a new, modern high-speed fourdrinier, production capacity at the plant will be increased materially. Also, the new machine, costing between $9 and $10 million including pulp refining equipment, is designed to make better quality light paper sheet.

The seven paper machines now in operation at this mill have widths ranging from 92 to 152 in. The width of the new machine has not yet been settled by the company and its engineers.

In comparison with the older machines' maximum speeds of around 1200 fpm, the new machine will have a maximum speed of approximately 2000 fpm. It will also have an increased number of automatic controls — close to 400 — which will make it a precision unit of most advanced design.

One of the reasons for installing this most modern machine at Luke is to meet the market's growing demand for light-weight and high-quality publication paper of 42 or 43 basis weight. This demand comes from the trend in the magazine and related fields to cut publication and mailing costs.

In the words of Mr. Luke, "Radio and television compete with publication papers for advertising and may conceivably slow up our rate of growth in the so-called cultural field. To meet this challenge the industry must redouble its efforts to produce printing papers of high quality which permit faithful reproduction in color and at low cost."

He adds that with the introduction of such modernized facilities at Luke, "we anticipate considerable cost reduction in our white paper mills."

New pulp and paper mill

The most likely site for West Virginia's proposed new pulp and paper mill in the Appalachian area is Tyrone, located in central Pennsylvania and considered a good pulpwood producing section. Present projections anticipate the new mill will be capable of producing 300 tons daily of hard white papers, some to be sold to printing markets and some to converters.

The principal problems surrounding the choice of a site for the mill are the economics of water supply and of stream pollution. Says the firm's president: "The number of economically feasible sites for new big mills is distinctly limited by water supply . . . and streams that can take the effluents without excessive anti-pollution costs."

West Virginia Pulp & Paper already has a mill in operation at Tyrone, running four paper machines, with capacity for producing about 145 tons of white printing and converting papers per day. The new mill's capacity of 300 tons will be about double that of the present plant.

Currently, the company is doing engineering studies at Tyrone to discover if the area can support a new mill of the size desired by supplying sufficient water for processing and for dilution of waste products.

It is interesting to note that the company figures it will require, at current costs, about $100,000 per daily ton to build new capacity.

New coating machines

In its extensive expansion program, West Virginia is also including an experimental paper coater, and new-type coaters for three machines at its Luke plant. These are now on order and under construction, and each of them will cost over $400,000.

The experimental coater will be the first one ever used for experiments outside the research laboratory and will test the application of new types of paper coatings.

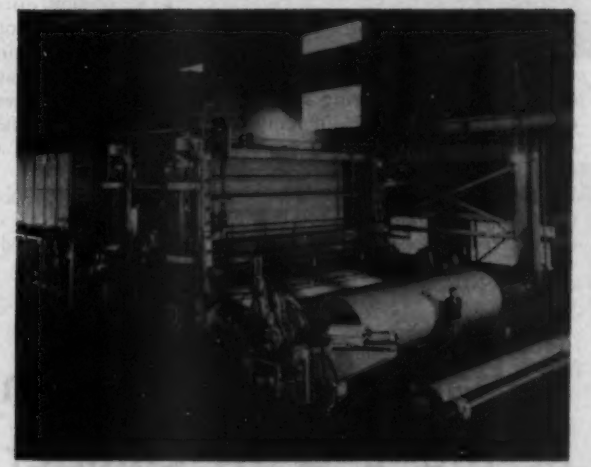
New tall oil refinery

A decision to erect a new tall oil refinery at Charleston is another feature of the Company's expansion pro-

Luke, Md. plant of West Virginia Pulp & Paper

West Virginia Pulp & Paper's plant at Charleston, S. C.

New fourdrinier paper machine, designated as No. 8, recently placed in operation at the Covington, Va. plant of West Virginia Pulp & Paper. The unit is powered by a 1900-hp steam turbine and operates at 200 to 2000 fpm



Dry end of the 216-in. board machine at the Charleston, S. C. mill of West Virginia Pulp & Paper. The unit is producing the recently developed improved surface linerboard, ISL

gram. It will refine crude tall oil and produce about 17,000 tons of refined tall oil products a year. This will supplement the output of the firm's refining tall oil plant at Covington, Va., the first distillation unit of its kind ever built in the United States.

The new refinery is costing over $1 million and is planned to be in operation in the fall of 1955. Previously, the company has produced only crude tall oil at Charleston.

Expansion of subsidiaries

West Virginia Pulp & Paper is bringing into its expansion plan further development of its subsidiaries in this country and abroad.

On the domestic front, its principal subsidiary and box division, Hinde & Dauch Paper Co., early this year began construction of a new $2,350,000 box factory at Gastonia, N. C., scheduled for opening this summer.

Located in a growing industrial community in the center of an important furniture and textile manufacturing area, this new Gastonia factory will employ from 100 to 125 people when full operations begin.

And Hinde & Dauch has also just recently started to build a new box factory at Kansas City, Kan., which should be in full production late in 1955. It is planned to increase company facilities already existing here in line with rapid industrial expansion in this area.

As if this were not enough, the box division is further looking around at several other sites for new box factories. For West Virginia believes the demand for corrugated shipping containers is on the upswing, and that their market will not be affected by plastics and films which are chiefly used in flexible packaging.

A part of the over-all picture of the paper company's expansion program is the ownership of majority stock interest in Hinde & Dauch Paper Co. of Canada Ltd., the most important manufacturer of corrugated shipping containers in Canada. In May, 1955, this subsidiary formally opened its new Etobicoke box factory in Toronto, the largest single box factory in North America.

In Brazil, West Virginia Pulp & Paper has plans for further growth of its wholly-owned subsidiary, Rigesa, S.A., which produces corrugated products for the Brazilian market, and is located at Valinhos in the State of Sao Paulo.

The expansion program projects just outlined point to West Virginia's belief that success and progress in the paper industry demand both good diversification of product lines and control of market outlets.

New ideas in paper making — at the TAPPI Coatings Conference

Electrostatic process for coating paper

(R. B. Rolf, Battelle Memorial Institute)

▶ Dry coating may be applied to paper by depositing an electrically-charged and air-suspended dust cloud (average particles size of 5-10 micron) of pigment and heat-sensitive resinous binder on a moving belt of paper in an electrostatic field. The coating is then fixed by the application of heat, which permanently fuses the resinous binder and pigment to the paper.

Coatings from 20-30 lbs. have been deposited on webs moving at the rate of 100 fpm. Over 700 different coating formulations have been evaluated ducted for Bergstrom Paper Co. The in the course of this research concost of this process is said to compare coating applications.

Flow properties of coating clays

(Glen Hemstock and John Swanson, Institute of Paper Chemistry)

▶ Variable viscosity or flow property of coating clays is due primarily to the small variable amounts of bentonite-type minerals present in the clays.

Importance of proper pigment dispersion

(W. R. Willets, Titanium Pigment Corp.)

▶ Maximum dispersion of pigments is essential for optimum results. The presence in coating color of oversize materials, such as loosely bound aggregates, agglomerates, and flocculates, causes poor finish, uneven printing, picking, dusting, and decreased hiding power.

It has been observed that flocculation may occur if casein or isolated protein are added rapidly to well dispersed water slurries of titanium dioxide or clay. There is no flocculation if casein is added slowly.

Dispersants of calcium carbonate

(Clyde W. Leaf, Wyandotte Chemicals Corp.)

▶ Acqueous slurries have been prepared that contain 70 per cent calcium carbonate and show viscosities of about 10,000 cps. When diluted to lower solids concentration these slurries show unexpectedly low viscosities, much lower than obtainable when slurries are made up directly to the desired concentration.

A comparison of various inorganic and organic dispersants shows that polyphosphates are generally good dispersants, while organic dispersants are relatively ineffective.

(Continued on page 479)

Debarking and chipping at the L & M Lumber Company

FLAMES FROM THE slab pit of the L & M Lumber Co. in Willis, Texas, have died to just a spark since the installation of debarking and chipping machinery.

J. F. Muller, owner of L & M, reports that aside from two very large mills, his sawmill is the first in Texas to use such equipment. The new pulpwood machinery will utilize the sawmill's waste, which in past years amounted to a year's growth on approximately 4,480 acres. Instead of 80,000 pounds of discarded wood going up in smoke each year, waste from debarked logs is now broken into chips and blown into waiting boxcars for delivery to the paper mill.

Formerly the demand for chips was not sufficient to be profitable. However, the market is now open in the local paper mills for all the chips the sawmills can supply.

Debarking and chipping operation is a new experience in the Willis region. Other mill owners in the area are keeping their eyes open to the efficiency and success of the new equipment with the thought that, if this operation in Willis proves satisfactory, they will make similar installations in their mills.

With the installation of this new equipment, Mr. Muller built three unloading docks. The increase in the unloading area means more logs are handled and production is stepped up. Incoming logs are cabled and pulled down the docks by a caterpillar. Individually the logs then drop into a chute and slide along rollers to the entrance of the debarker.

A hydraulic ram propels the pine logs one by one into the Soderhamn machine, which is powered by two Westinghouse motors. The machine takes logs 8-20 ft. long and measuring 5-26 in. in diameter.

The log is held stationary by guide rollers under air pressure while whirling teeth strip off its bark. The discarded bark falls under the machine and is carried to the burner on the conveyor system.

Upon removing the bark, the logs are shot from the machine and, motivated by rollers, are pushed down a ramp to the pond and then to the saw.

The portion of the log not cut for board is then sent to a Soderhamn chipper. The chips are blown into a Link-Belt sifter.

From the sifter, the wood chips are blown to a storage bin, where provision is made for truck loading underneath. The L & M Lumber Co. is located about half a mile from the railroad, so all chips and boards must be carted by truck to the tracks.

Just off the railroad siding is a loading platform where trucks can back up and unload their chips into storage. A duct serves as a link between the storage bin and the tracks. Boxcars are drawn into the siding beside the duct and chips are blown into the cars.

One car load of chips is sent daily to the Champion Paper & Fibre Co. in Pasadena, Texas.

While the cost of the debarking and chipping installations at L & M runs rather high, the operation will show a profit in future years.

Fig. 1—Logs at L&M Lumber Co. drop from the docks to the conveyor leading to the shed housing the Soderhamn debarking machine

Fig. 2—View from back of the Soderhamn machine shows a log ready to be propelled into the teeth of the debarker

Fig. 3—Soderhamn chipper receives waste from the chain conveyor, cuts the wood into chips and blows them to the sifter

Fig. 4—Large chips remain on top of the Link-Belt sifter and are carted to the slab pit. Air from the blower is released through the funnel at the top

Fig. 5—From the sifter on the right, the chips are blown to the storage bin on the left, where trucks are loaded

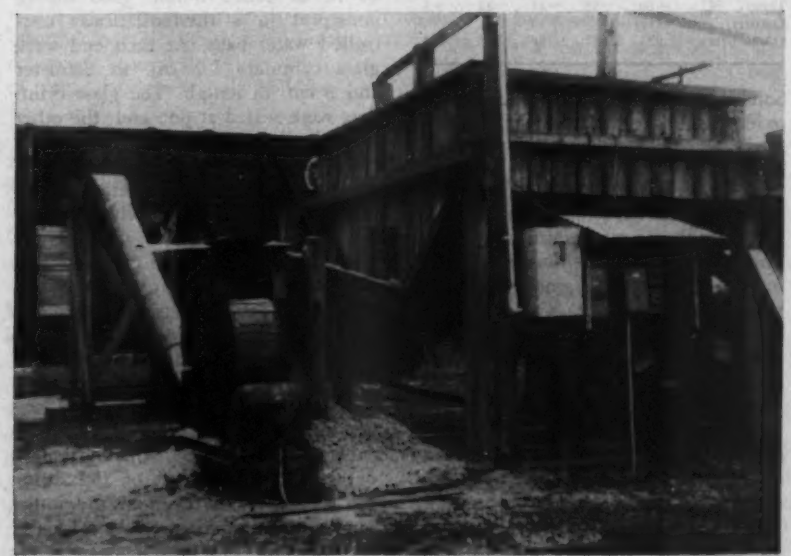
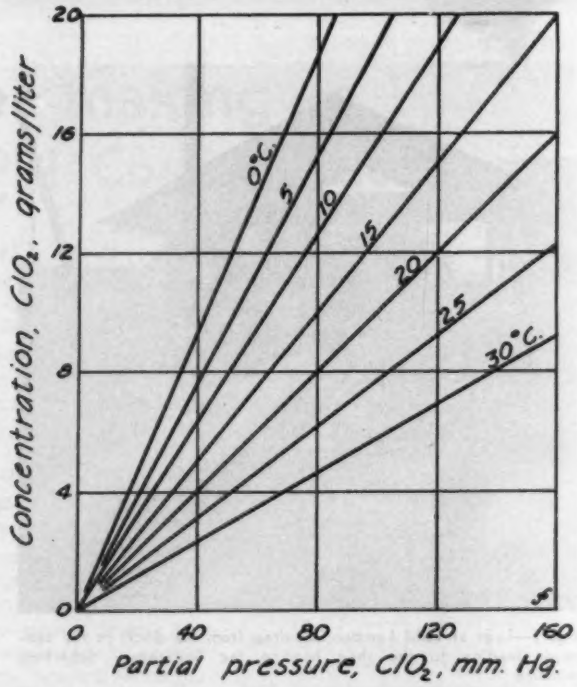


Fig. 6—At the railroad, chips are blown from this storage bin into waiting boxcars at a siding

Safety aspects of chlorine dioxide*

J. F. HALLER and W. W. NORTHGRAVES
Olin Mathieson Chemical Corp.

Condensed by D. S. Davis
Professor of Chemical Engineering
Virginia Polytechnic Institute



GENERAL ACCEPTANCE of chlorine dioxide as a bleaching agent in the pulp industry has been delayed because (1) market conditions, until recently, have not favored the additional expense of producing bright, strong pulps, (2) satisfactory processes for making chlorine dioxide have not been available, and (3) many believed chlorine dioxide to be extremely hazardous. However, 25 pulp mills in North America are now bleaching with chlorine dioxide or are planning to do so. For this reason some attention to the properties and safety aspects of this material is desirable.

Properties

At ordinary temperatures chlorine dioxide is a yellow-green to orange gas with a disagreeable odor between that of chlorine and that of ozone. The liquid is red and unstable; it freezes at −59°C. and boils at 11°C. The density of the liquid is given by the following table:

Temp., °C.	−60	−33	−21	−17	+5
Density, grams/liter	1.973	1.907	1.788	1.733	1.635

Solubility isotherms for chlorine dioxide are linear with partial pressure, as shown in Fig. 1.

Temperature of initiation of explosion

To study the temperature of initiation of explosion, chlorine dioxide mixed with various amounts of air was generated at 27° C. and introduced into a glass tube 2 cm. in diameter and 15 cm. long, loosely closed with glass wool. While the gas flowed gently through the tube, it was heated by means of a nichrome wire wound around a thermometer well. At various partial pressures the temperature of ignition was measured and samples were withdrawn for analysis. Between partial pressures of 100 and 300 mm. ignition temperature remained in the neighborhood of 130° C. Mild explosions displaced the glass wool plug without damage to the apparatus.

In clean systems no explosions occurred even at volume percentages of 20. Sulfur, petroleum-base lubricants, dust, and inorganic compounds lowered the decomposition temperatures. For operation at concentrations in excess of 10 per cent, feed streams should be filtered; proper packing for valves and pumps should be used.

Rate of propagation of explosion

Apparatus for the study of rate of propagation of explosion consisted of 40 ft. of coiled 6-mm. glass tubing immersed in a thermostatically controlled water bath. At each end were glass cylinders 1.2 cm. in diameter and 8 cm. in length. The glass cylinders were sealed at one end; the other was fitted with a ground-on glass plate supported by a spring and equipped with electrical contact points which closed a circuit when an explosion took place.

During operation the cylinders and tube were filled with gas, the system was closed, and the gas was ignited. Initiation of explosion was recorded on a drum that revolved at a known rate. A small jet of flame travelled through the coil, and its arrival was recorded on drum. The rate of propagation was calculated from the length of travel, the velocity of the drum, the separation of the final and initial marks on the recorder. At 27.5° C. the rate of propagation was linear with partial pressure between 100 and 300 mm. At temperatures of 40° and 60° C. the rate of change of rate of propagation with partial pressure increased with increasing partial pressures. At partial pressures even slightly above 300 mm., simultaneous explosions in the first and last cylinders and in the tubing occurred—an indication that a detonating type of propagation had been suddenly attained. Even these detonating explosions did not damage the glass apparatus.

These experiments enabled the design of a pilot generator for a 1500-lb. per day chlorine dioxide unit and two 4-ton production units at the Niagara Falls plant of Olin Mathieson Chemical Corp. For operation up to 20 per cent chlorine dioxide, explosion relief areas of about 0.09 sq. ft. per cu. ft. of gas volume were found to be entirely adequate. Many 3-ton per day Mathieson chlorine dioxide generators now being built for the paper industry follow this design.

Experiments with a cardboard-covered 4-liter beaker as the chamber and with systems that contained 26 per cent of chlorine dioxide showed that ignition resulted merely in a soft explosion that blew off the cover without damaging the beaker. Decomposition of chlorine dioxide at concentrations in excess of 20 per cent led only to low-order explosions that could be described as "puffs."

As produced in the paper mill, chlorine dioxide is always diluted with nitrogen or air and contains varying amounts of carbon dioxide, chlorine, and hydrogen chloride, de-

(Continued on page 479)

*Original paper: Tappi, 38 (4) 199 (1955).

Good working conditions mean efficiency

DR. W. SCHWEISHEIMER

IT HAS BEEN SAID that the average supervisor spends 20 per cent of his thoughts on production and 80 per cent on worker relations.

And that 80 per cent pays off well in the form of efficiency, in avoiding absenteeism and labor turnover, in direct increase of production and in many cases in safer working conditions.

The efficient worker usually is one who is happy both with his job and his boss.

Eight basic worker needs

Here are eight "basic worker needs" that constitute a common formula for keeping working people happy. They were devised by the Employee Attitude Research Group of the Industrial Relations Center of the University of Chicago.

(1) Workers do not like "bossiness"

(2) Workers want and need freedom on the job

(3) They want job security and opportunity for advancement

(4) Workers want fair treatment at all times, with promotions and pay increases when they are earned

(5) They want to be able to speak their minds

(6) The working man wants to be able to make a mistake now and then without being afraid of being crucified for it

(7) They want what every man and woman wants, working or not-working: Friendly treatment by fellow employees and by their bosses

(8) They want to be kept well informed on company matters

These eight basic worker needs are also basic company needs. People who are interested in what they are doing do not like to be left in the dark. In particular, much more could be done—to the profit of the companies—in keeping workers well-informed on company matters. House organs are of valuable help.

Improving working conditions

Business, government and labor got together recently in Washington's Library of Congress to study the possibilities of improving working conditions in offices and plants. There is an increasing conviction in business and industry that improper environment in plants and offices affects efficiency and production.

The experts gave some suggestions on how to get better "seeing" conditions for the worker. Seeing conditions include, in addition to illumination, the brightness of the surroundings, tasks, light sources, fixtures, windows, etc. A report in *Business Week* stressed these points. Use dull-finished paper and work materials and non-glossy ink. The brightness of the surroundings should be about the same as that of the task.

Use of color, according to the Washington discussions, should be functional rather than decorative. No surface in an area should be more than five times as bright as any other surface. Ceilings should be white for maximum light reflection. Walls should reflect between 50 and 60 per cent. Warm lights are preferable to cold lights, which create the illusion of coolness and unfriendliness.

A direct relationship between noise and fatigue was disclosed. No one minds his own noise, he is annoyed by other people's noise. Drapes, floor coverings, acoustical ceilings, enclosure of noisy equipment, all help to cut down noise.

Air conditioning is helpful in many respects. No harmful effects due to entering or leaving an air-conditioned building on a hot day have so far been observed.

Workers' wives should keep them happy

Markel Service Inc., a firm of safety specialists and insurance underwriters, pays special attention to workers' wives to increase the safety of driving and working. Four rules are emphasized in this connection. Before a man checks in for work, his wife is advised to exercise her gentle influence by (1) giving him a hearty breakfast, (2) keeping the children out of his hair, (3) saving domestic problems, arguments, and possible tantrums until he returns at nightfall, and (4) sending him off with a cheerful smile.

When do they eat?

A new eating schedule has been suggested to industry: Cut out leisurely, hour-long lunch periods and give the lost time back to employees in midmorning and midafternoon "lunch-snack" periods. Experiments conducted at Yale University seemed to indicate that the human organism does not work at its best under the traditional three-meal-a-day system. It does better if it gets about the same amount of food in four meals.

Marshall Field & Co. in Chicago has suggested a (completely voluntary) change of lunchtime for its employees. Sales people in the noon-rush departments should combine their one-hour lunch period and 15-minute morning and afternoon rest periods and take half the combined time (45 minutes) sometime before noon, the other 45 minutes in midafternoon. Twenty per cent of the sales people (and practically all those in the noon-rush departments) have shifted to the new time plan and are satisfied with it. The plan, Marshall Field says, has resulted in better service for customers and more efficient departmental operations in rush hours.

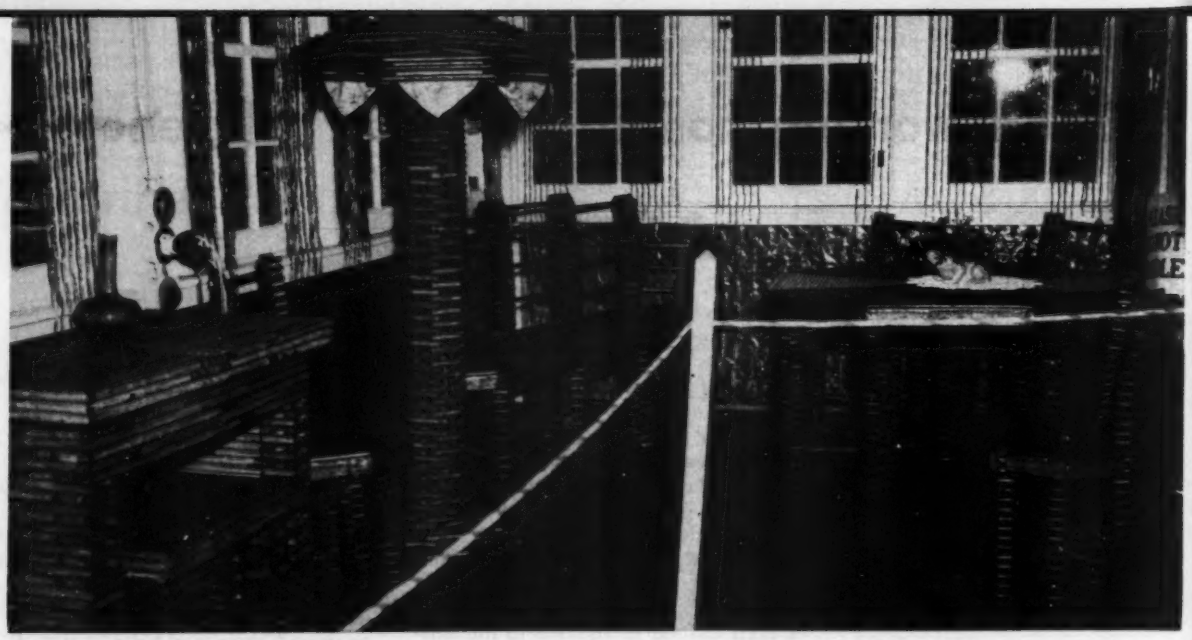
Short in-between snacks

Workers in an industrial plant, or even executives, often feel tired out in the afternoon.

A cup of coffee or a piece of cake often revives them immediately. The fatigue disappears. They feel cheerful and are ready to return to work.

For a long time we have known that coffee is stimulating to the brain, but it seems that there is more in its effect than just stimulation of nervous elements. Recent investigations have shown that caffeine—the effective drug in coffee and tea—has a direct action on the muscles. It increases the capacity for muscular work in rested persons as well as the speed of muscular recovery of fatigued persons.

Maybe the only thing that is wrong is a low content of blood sugar in the blood (hypoglukaemia), and the sugar in the coffee or in the piece of cake has restored the equilibrium in the sugar metabolism.



The story of the 1927 trans-Atlantic flight of Charles Lindbergh is told in the newspapers out of which the writing desk is made. The chairs, lamp and settee tell the tale of World War I via the pages of the Christian Science Monitor

The house that paper built

QUALITY LUMBER being in short supply and high priced, Elis Stenman decided to build his house at Pigeon Cove, Mass., out of newspapers — 100,000 of them.

The job took the Massachusetts man three years. And, while he was about it, Stenman built most of the furniture for the house out of the papers he and his family had gathered.

Floors, foundations and beams, while of conventional materials, are enclosed with folded and glued papers. The walls when finished consisted of 215 thicknesses.

The entire interior of the Paper House is a story of recent history and current events. The grandfather's clock (1) is fashioned of newspapers from the capital cities of each state. Walls are papered with the old newspapers, and window drapes are similarly styled.

Rotogravure sections of the Boston Sunday Herald and the New York Herald Tribune form the decor of the fireplace. The newspapers have proven to be a revelation in both their strength and stability as a building material

TORKEL KORLING

SPEED SAND SLINGER *in the foundry at Beloit Iron Works.* / *For further details, please turn the page.*

SPEED SAND SLINGER

The photograph on the preceding page shows the main foundry bay at Beloit Iron Works, Beloit, Wisconsin. Hovering like a giant arm is the boom of the automatic sand slinger from which an almost invisible stream of sand is sprayed with the impact of rifle fire. By this means, each flask is evenly rammed, insuring a casting that is a true reproduction of the pattern. Careful technological control of sand characteristics and metal analysis is an important production factor. Result: castings of the highest obtainable quality.

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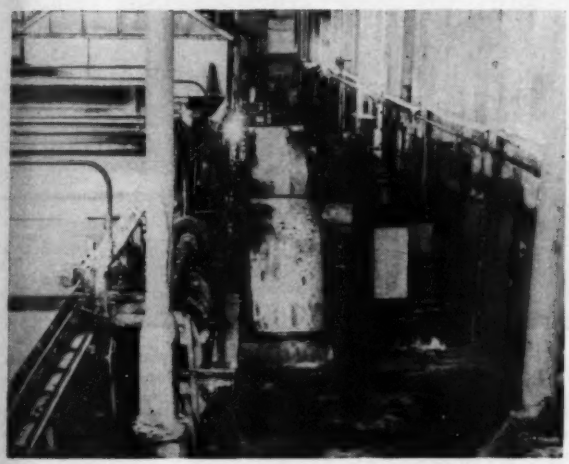
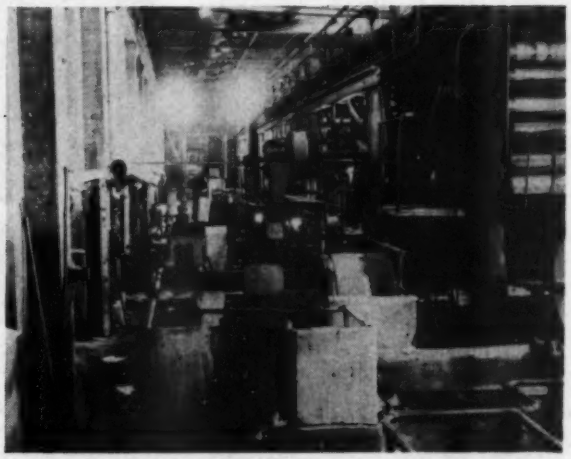
NEWS of the INDUSTRY

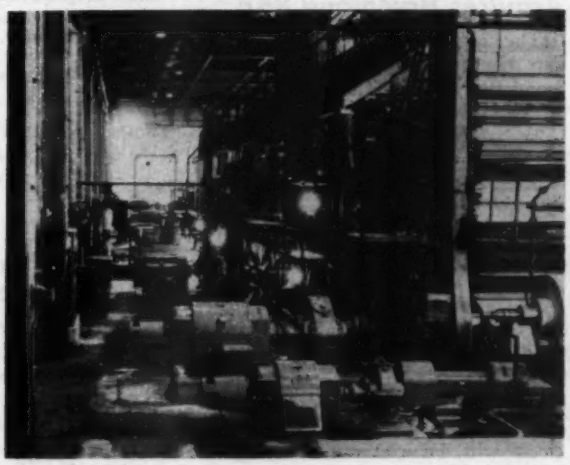


OLD DRIVES from wet end of No. 4 paper machine



OLD DRIVES from dry end of No. 4 paper machine

NEW DRIVES from wet end of No. 4 paper machine



NEW DRIVES from dry end of No. 4 paper machine

Another Step in Modernization at Iroquois Falls: New Machine Drives

A FURTHER MOVE in its extensive modernization program has been completed by the Iroquois Falls (Ont.) Div. of Abitibi Power & Paper Co. Ltd. with the installation of modern drives on four paper machines.

With completion of the project, some increased speed has been realized. In April the division neared its goal of an average daily production of 800 tons. However, before the machine speeds can be boosted to the rated drive capacity of 1400 fpm, other improvements and alterations will be necessary. Some of these, scheduled for completion in 1955, include:

The replacement of the constant-speed line shaft with individual drives for all four units; the replacement of table rolls on Nos. 1, 2 and 3; the replacement of steam and condensate headers; the rebuilding of the winder on No. 1 unit.

More Output with Safety

Basic reasons for the replacement of the old steam engines and rope drives with the modern equipment were (1) the 40-year-old steam engines had become unreliable for continuous operation; (2) the cost of maintaining the old units was excessive; (3) the engines and rope drives could no longer be considered safe, and (4) the output of the machines was not high enough for efficient mill operation.

Following placement of orders for Canadian General Electric Co. amplidyne controlled drive units, the Abitibi staff tackled the various design problems. Foremost of these was providing adequate space for housing the substation, control panels, and ac starting, motor generating and amplidyne control equipment.

It was decided to locate this control room under the finishing room and directly in front of the paper machines involved. Constructtion of the 236- by 32-ft. room, along with the adjacent bases for the two 2000-kva transformers, began in November 1953 and continued until November 1954.

Other major preparatory work completed during this period included a new fan and filter room at the south end of the finishing room. Purpose of this installation is that of supplying cooling air to the control room and thence through underground concrete ducts to the actual drive motors.

The actual drive installations required one week per machine.

SCHOLARSHIP COMMITTEE of the School of Forestry at North Carolina State College, whose members recently announced the award of 14 scholarships to top-ranking students. Valued at $23,400, the scholarships are made possible by gifts from the Pulp & Paper Foundation Inc. Seated (l to r) Elmer Leavitt, general superintendent for North Carolina Pulp Co.; Ian Sim, technical director for International Paper Co. at Georgetown, S. C.; Ramsey Buchanan, director of public relations for Mead Corp. at Sylva, N. C., and chairman of the scholarship committee, and Robert Aranow, personnel director for Riegel Carolina Corp. at Acme, N. C., who represented Dr. C. E. Hartford, Riegel Carolina vice president and general manager. Standing (l to r) R. G. Hitchings, committee secretary and assistant professor of pulp and paper technology at North Carolina State; Dean Richard J. Preston of the School of Forestry, and Prof. C. E. Libby, director of the pulp and paper program at the School of Forestry. Not able to be present at the meeting was Dr. H. Y. Charbonnier, assistant general manager of Union Bag & Paper Corp.

Hudson Pulp & Paper Acquires Hammond B&P

The acquisition of the multiwall bag manufacturing business of Hammond Bag & Paper Co. of Wellsburg, W. Va., by Hudson Pulp & Paper Corp. of New York, N.Y., has been announced by the latter firm.

According to William Mazer, president of Hudson, "the acquisition will afford Hudson additional converting and shipping points at three desirable geographical locations. Hammond plants are located at Wellsburg, W. Va.; Pine Bluff, Ark., and Charlotte, N. C."

Hammond will operate as a separate division with the same executive sales and employee personnel. Sales operations will be continued under the Hammond name.

Certain-Teed Buys Roofing Firm

Certain-Teed Products Corp. of Ardmore, Pa., has disclosed that its offer to purchase the outstanding stock of Gold Seal Asphalt Roofing Co. of Chicago Heights, Ill., has been accepted by holders of 95 per cent of Gold Seal's stock.

The Illinois company was organized in 1938 and since 1939 has owned and operated an asphalt roofing plant. A subsidiary, Briksulite Co., also of Chicago Heights, manufactures and distributes insulated siding.

Certain-Teed has also announced that it has offered to purchase at $8 a share a net amount of 100,000 common shares of Valspar Corp.

Olin Mathieson Purchases Brown Paper Mill Co.

Olin Mathieson Chemical Corp. of New York, N. Y., has more than doubled its timber resources by acquiring Brown Paper Mill Co. Inc. of West Monroe, La. Brown controls approximately 465,000 acres of pine and hardwood timberland.

Brown forests are located in Louisiana, east Texas and Arkansas and are adjacent to Olin Mathieson's 435,000 acres in those states. The purchase will permit OM's forest products operations to be accelerated.

Olin Mathieson already manufactures a wide variety of forest products under the Frost brand name. These include lumber, flooring, utility poles and furniture.

Brown Paper Mill Co. and its associated corporations were purchased for $50,000,000 in cash and 725,000 shares of OM common stock—a total of about $90,000,000 at recent market values.

Brown's associated manufacturing companies include Brown Paper Industries Inc., Brown Container Co. Inc., Krafco Container Corp., and Negley Bag & Paper Co., all located at West Monroe. They manufacture kraft paper, paperboard boxes and paper bags.

New Machine Included in Longview Fibre Expansion

Longview Fibre Co. of Longview, Wash., will install paper machine No. 7 in an expansion program recently announced by the firm. The unit will have a daily capacity of 150 tons when producing lightweight kraft papers and 250 tons when making containerboard. The addition of the machine, which is scheduled to go into production by the end of 1956, will bring the company's daily production of paper and containerboard to between 1000 and 1100 tons.

Three additional digesters and the necessary related equipment are being installed in the kraft pulp mill to supply the pulp required for the expanded production.

The company is proceeding with the construction of the pilot plant announced some months ago for the development of a process suitable for

the production of various types of containerboard at the projected plant in Springfield, Ore.

By expanding at Longview prior to starting at Springfield, urgently needed additional production of both paper and containerboard will be attained in the shortest time and at minimum capital cost.

C-Z Reorganization Aimed at Complete Utilization of Forest and Mill Wastes

Implementing its goal of attaining the maximum use of timber resources, Crown Zellerbach Corp. has announced a program advancing the firm's research, processing and sale of new chemical products from forest and mill waste materials.

A principal change has been the reorganization of the Central Research Department at Camas, Wash. According to Dr. Wendell W. Moyer, director of research, fundamental research and development sections will be headed by specialists.

Dr. W. M. Hearon, assistant research director, has been named general manager of the newly created Chemicals Products Div., which replaces the Industrial Products Div. and in addition assumes part of the Central Research Department organization. In his new position, Dr. Hearon takes full responsibility for creative research on ideas for new products from pulping wastes, their production and sale when proven commercially feasible.

Pilot Plant at Camas

Coincident with the research staff changes, construction of a pilot plant at Camas has been authorized. The operation will produce an annual 2,000,000 lb. of dimethyl sulfide as an entrant into the field of bulk organic chemicals. The plant is to be built in connection with the Camas kraft mill. (Dimethyl sulfide is derived from kraft processed liquors and is one of the substances responsible for kraft mill odors.)

The pilot plant will be C-Z's second venture into the production of chemical products. In 1953 the firm began producing Orzan, the trade name for a class of substances derived from pulping wastes at its Lebanon, Ore. paper mill. Orzan is the result of evaporating water from the ammonia base spent liquor and spray-drying the concentrate in towers where it forms as a powder. It is being put through thorough tests in 21 categories of use ranging from an ingredient of gypsum board to a corrective for certain soil deficiencies.

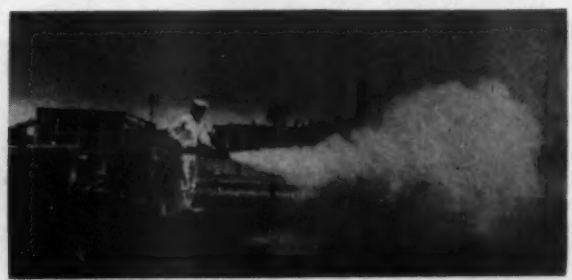
In announcing the company's expanded program into chemical products, R. O. Hunt, vice president for manufacturing, declared: "While we do not expect miracles over night, Crown Zellerbach confidently feels that its scientists and manufacturing units will be able to produce a number of saleable products from lignin and other wastes that now represent a distinct loss. We're going to give the program a hard try, and if successful, we will do three things: create a new type industry, get more mileage from our timber, and make a substantial improvement in stream conditions."

National Gypsum to Build Alabama Plant

National Gypsum Co. has announced that it will build a multi-million dollar wallboard cover paper manufacturing pant in Calhoun County, Ala. It will be the 39th plant operated by the firm and is part of a recently announced $75,000,000 expansion program.

Estimated daily production at the Alabama operation will be 150 tons. Output will be shipped to National Gypsum's processing plants at Savannah, Ga., and Baltimore, Md., and to two units now under construction at Shoals, Ind., and New Orleans.

PEST CONTROL MEN inspect and spray plant interiors at KVP Co. for such insects as moths, beetles, silverfish and termites



INSECT-BREEDING areas are sprayed regularly, usually during the night or early morning, through the summer months

KVP Reduces Insect Damage to Paper Through Intensive Pest Control

A bug, properly flattened, printed in four colors and waxed, might appeal to an insect fancier. But, it's an unwelcome sight in the paper industry — particularly in that segment specializing in food protection.

During the summer months mosquitoes and other night-flying insects can prove especially annoying to a paper mill. When they tangle with a huge paper machine, they become part of the paper in a jiffy.

KVP Co. of Kalamazoo, Mich., keeps insect damage to paper at a minimum through an intensive pest control program; at frequent intervals it inspects and sprays nearby fields and plant interiors.

The maker of food protection papers has employed a Kalamazoo pest control service for the past 12 years to battle the insects on a year-around basis.

Areas around the plant are sprayed often. The potential insect invaders can be any of some 100 different varieties, but the most common are gnats, mosquitoes, chiggers and June beetles. Every week during the summer months men inspect the fields around the plant with a special light-box that attracts and counts the bugs. Tests are made in the late evening, and if more than two insects per square foot are found, spraying begins immediately. By daylight, the surrounding areas have been thoroughly treated.

Spraying Presents Problem

Spraying presents its problems. One is weather. A good rainstorm will wash away the effectiveness of the chemicals. The insects, too, are a problem, for they eventually become immune to certain sprays; thus, new insecticides are continually being put into use.

Normal spraying procedure starts with the old stand-by, DDT. Certain

insects are easily killed with the chemical, but others "have grown used to it." So, the initial spray of DDT is followed with chlorodane or methoxochlor. If even these do not achieve the desired results, the insect specialists resort to malathion.

Continual spraying during the summer months greatly reduces the number of night-flying insects around the mill and surrounding residential areas. However, in addition to the nightly raiders, there are certain insects that set up housekeeping inside the mill proper. These include silverfish, moths, flies and carpet beetles, the latter being particularly fond of the woolen felts on the paper machines. To combat these, the interior of the mill is sprayed regularly twice a month. Also, the pest control service is on call in the event that insects are discovered between sprayings by plant employees.

Special insecticides and spray guns are used by the pest control service for inside work, as each industrial plant has its own special problem, depending on the type of raw materials used. Wood pulp, for instance, will attract a different insect variety than will grain or chemicals.

Anglo-Canadian Kills Plans for Sask. Mill

Anglo-Canadian Pulp & Paper Mills Ltd. has shelved plans for building a mill in northern Saskatchewan. The firm is now looking into possibilities in the Sioux Lookout area of northern Ontario.

Anglo-Canadian took an option on 2000 sq. miles 50 miles northeast of Prince Albert in 1953. When, a year later, it was granted an extension, speculation was that a kraft pulp mill might be established.

Now, however, the company has decided not to go ahead. Reported to be the reason are problems involved in transporting products to market.

Lee Paper Marks 50 Years of Papermaking

Lee Paper Co. recently celebrated its 50th anniversary at ceremonies attended by paper industry officials from throughout the country. The Vicksburg, Mich. firm produced its first paper on May 31, 1905.

In a brief talk during the celebration, E. H. Neese, chairman of Beloit Iron Works, declared, "I don't know any firm in the industry with greater vision and better judgment. From now on, watch them go."

The golden anniversary coincides with one of Lee's most auspicious expansion programs, which will cost in the neighborhood of $1,000,000. Included in the project is an addition to the mill and the installation of the firm's fourth paper machine.

From Small Beginnings

Lee Paper was organized July 16, 1903, by Fred E. Lee, president of Round Oak Furnace Co. of Dowagiac; Archie B. Gardner, treasurer of Round Oak; George E. Bardeen, one of the Kalamazoo Valley's original papermakers and at that time operating Bardeen Paper Mills in Ostego; Elbert S. Roos, one of the early leaders in the firm now known as Ihling Bros. Everard; William G. Howard, a Kalamazoo attorney, and Charles H. Seitz, Lee Paper's first general manager.

The original mill, built in 1904, boasted two fourdrinier machines designed to manufacture rag papers. The output during the first years of operation was rated at about 35,000 lb. daily, while the weekly payroll for the 205 employees approximated $2400.

With a third paper machine installed in 1951, production is now running at about 150,000 lb. per day. More than 300 people are employed, and the weekly payroll is $30,000.

Since 1911, the Bardeens

Since 1911, the managership of Lee Paper has been continuously in the Bardeen family. Norman Bardeen, who was associated with the firm from the time of its founding as secretary and bookkeeper, was appointed general manager in 1911. He was elected president in 1931 and served until his death in 1936.

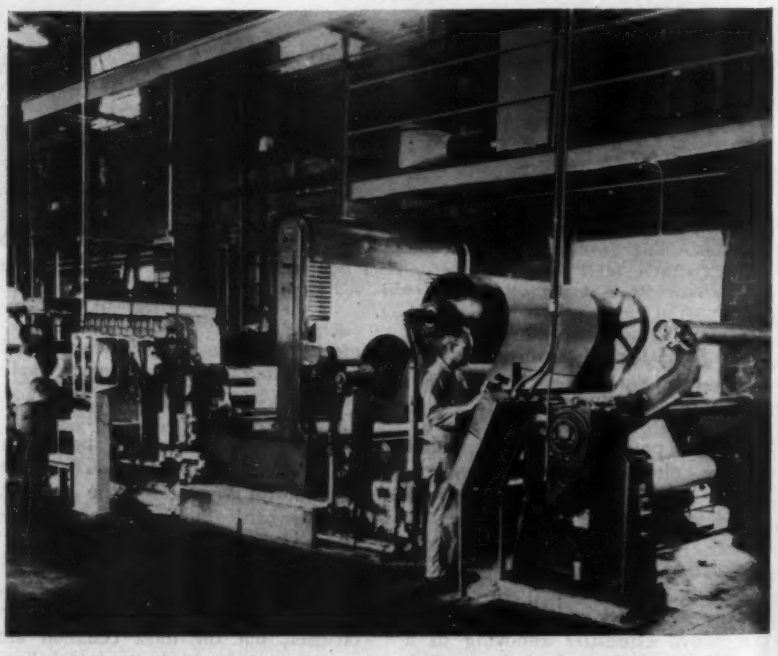
Following Mr. Bardeen's death, Maxwell D. Bardeen was elected president and general manager and has served in that capacity since that time.

Scott Completes Phase of W. Coast Expansion

Another phase of Scott Paper Co.'s expansion on the West Coast was completed late in June when No. 4 paper machine went into production at Everett, Wash., several weeks ahead of schedule.

The huge machine is located adjacent to its companion unit—No. 3, which was completed in February. A substantial quantity of supporting equipment, together with pulp preparation facilities, has been installed to supplement the output of No. 4.

Scott's expansion program at Everett began in May of 1953, when the corner stone of the paper mill was laid. The first paper machine was



HIGH-SPEED WAXING MACHINE recently installed by Potlatch Forest Inc. at Pomona, Cal. The Dilts unit has continuous unwind and wind equipment, is designed for operation without shut-downs for roll changes, and performs wet and dry waxing and one-side waxing operations. Capable of mechanical speeds up to 1500 fpm, the waxer consists of a Kohler system unwind with flying paster, a three-roll waxing section, polishing rolls, water finish section, cold rolls and a Kohler system continuous winder with flying starter

completed in December of that year. No. 2 went into operation in July 1954, followed last February by No. 3.

Consolidated WP & P to Modernize at Ahdawagam

A $400,000 modernization program for the Ahdawagam Div. of Consolidated Water Power & Paper Co. at Wisconsin Rapids, Wis., was announced recently by Frank R. Walsh, manager.

Plans call for razing of two outmoded buildings to make way for the construction of a 50,000-sq. ft. plant addition, which will provide facilities for the carton, roll storage and shipping box departments.

Mead Reduces Interest in Macon and Rome

The Mead Corp. of Dayton, Ohio, is reducing its 60 per cent interest in both Macon Kraft Co. of Macon, Ga., and Rome Kraft Co. of Rome. Mead now holds equal ownership with Inland Container Corp. of Indianapolis.

Inland, which manufactures boxes from paperboard produced by the Georgia firms, previously held a 40 per cent interest in the companies, with Mead controlling 60 per cent. Under the new arrangement, Macon Kraft becomes Georgia Kraft Co., with Rome Kraft as a wholly owned subsidiary. Mead will continue management control.

Nepco to Build Large Addition at Port Edwards

Final plans have been approved for the construction of a large addition to the Port Edwards, Wis. mill of Nekoosa-Edwards Paper Co. The project will provide increased warehousing and finishing facilities.

When combined with present structures, the building will present an uninterrupted span of approximately 700 ft. along the north elevation of the mill. A unique architectural feature will be the use of arched, cathedral-type windows.

The one-story and basement addition will consist of two connected sections, including a 218- by 85-ft. extension to the present finishing room and a 224- by 140-ft. extension to the present warehouse. When com-

For Durability Nothing Surpasses

TISCO® MANGANESE STEEL CHAIN

TISCO Pulp Wood Chain

TISCO Manganese Steel Chain lasts from 5 to 15 times as long as other chains in severe service.

In the Pulp and Paper Industry, TISCO Pulp Wood Conveyor Chain gives outstanding performance. The low frictional loss of manganese steel and the wide bearing area of the chain on conveyor trough result in substantial power saving and reduced wear.

TISCO Barking Drum Chain, is made to a greatly simplified design that not only increases strength but reduces the number of parts and expedites assembly. It is far and away the most economical barking drum chain made. It fits all sprockets and idlers. The center link is one integral unit. There are no bushings to work loose or break. Large bosses on the side links increase bearing on the pins, and greatly reduce both pin and link wear.

Attachment links specifically designed for most efficient log handling are readily available for use with TISCO Chain.

TISCO chain users report decreased maintenance expense from increased life of Manganese Steel Chain with fewer shutdowns for replacement.

Ask for further information regarding TISCO Chains for the Paper Industry.

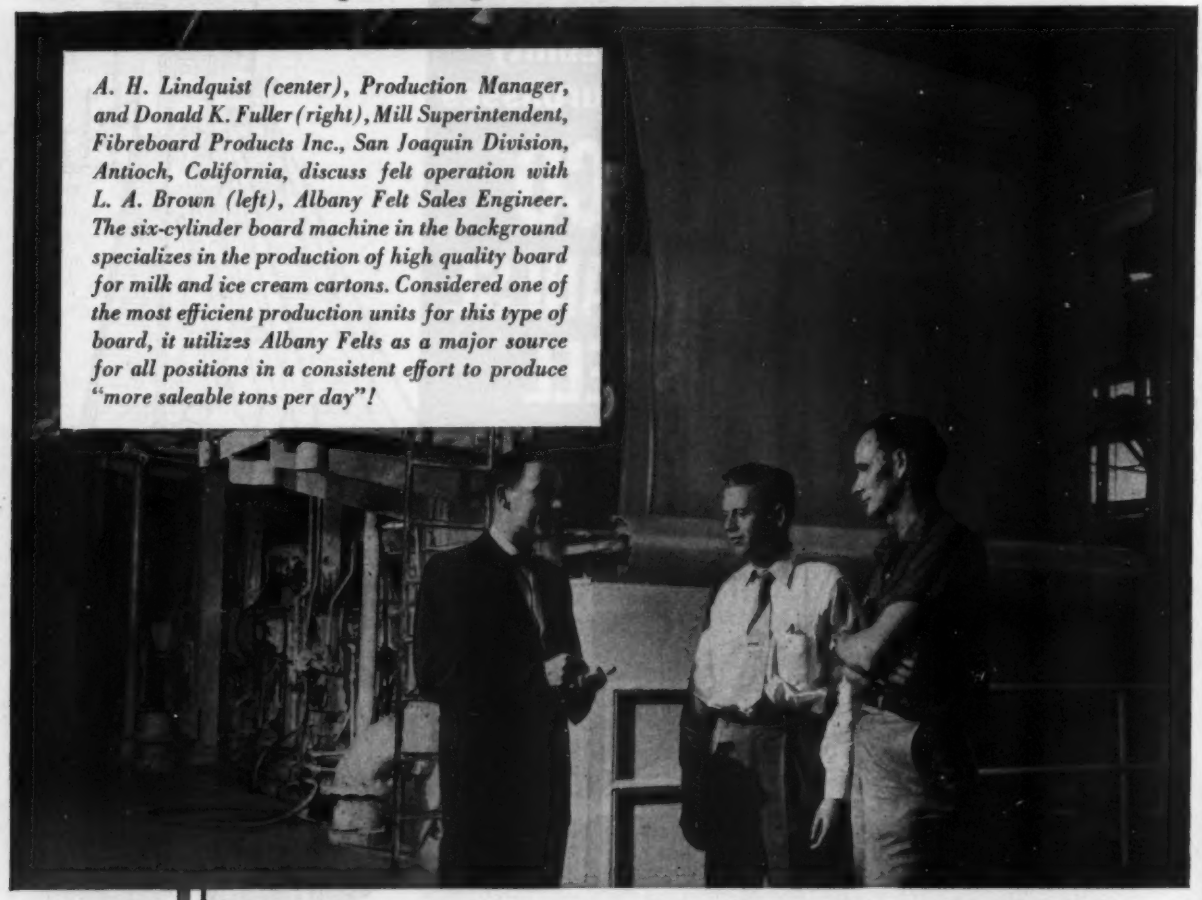
TAYLOR-WHARTON Iron & Steel Co.

(Division of Harrisburg Steel Corporation)

HIGH BRIDGE 5, NEW JERSEY

Birmingham, Ala. Cincinnati, O. Easton, Pa.

saleable
for more tons per day



A. H. Lindquist (center), Production Manager, and Donald K. Fuller (right), Mill Superintendent, Fibreboard Products Inc., San Joaquin Division, Antioch, California, discuss felt operation with L. A. Brown (left), Albany Felt Sales Engineer. The six-cylinder board machine in the background specializes in the production of high quality board for milk and ice cream cartons. Considered one of the most efficient production units for this type of board, it utilizes Albany Felts as a major source for all positions in a consistent effort to produce "more saleable tons per day"!

call in your Albany Felt sales engineer

When you're faced with a tough operational problem relating to felts—drainage, finish, life, or high-speed requirements—call in your Albany Felt sales engineer! Albany Felt sales engineers are trained technicians, experienced men with the "know how" to help you get the most efficient production from your felts. In addition, they are your liaison with the industry's leading service engineers and designers, and are backed by outstanding chemical and mechanical laboratories, and an extensive research and development program.

Take advantage of this experience *plus!* Call in your Albany Felt sales engineer to help solve your felt operation problems! He'll show you how the proper application of Albany Felts can help you maintain top production and sheet quality. The result: "MORE SALEABLE TONS PER DAY."

SLIDE FILM ON FELT MAKING. *If you're looking for an interesting, informative presentation for your training program or a mill personnel meeting, let us schedule a showing of Albany Felt's color-sound slide film "Felts for Paper Machines." Write today for full information.*

ALBANY FELT COMPANY

"World's Largest Manufacturer of Paper Machine Felts"

MAIN OFFICE AND PLANT, ALBANY 1, NEW YORK

Other plants: Hoosick Falls, N. Y.; North Monmouth, Maine; Cowansville, Quebec

pleted, the structure will permit closer integration with recently expanded finishing and warehousing facilities at the Nekoosa mill.

The revised layout of the Port Edwards finishing department will provide for seven production lines, relocation of cutters and space for a new cutter, new paper sorting areas, storage of paper stock before the trimming operation and enlarged department offices.

The warehouse addition, primarily providing additional finished paper storage, will be equipped with two large elevators for stock movement from the basement to the ground floor. A train shed will be provided to accommodate four cars on the siding. In addition, a truck dock will be added to receive sheeted paper and cartons from Nekoosa.

Charmin Proposes Multi-Million Dollar Expansion

Stockholders of Charmin Paper Mills Inc. in Green Bay, Wis., recently approved a five-point program of capital adjustment aimed at the further expansion of mill facilities. The proposed expansion would involve the expenditure of more than $8,000,000.

In his annual report, J. M. Conway, president, pointed out the need for increased productive facilities for pulp and paper manufacturing and additional warehousing and converting properties. "To maintain our position in the industry," he said, "and keep abreast of expanding sales, the directors approved a plan of capital readjustment and the sale of $5,000,000 of convertible debentures as the first step of an expansion program that will ultimately cost in excess of $8,000,000.

"Any major additions to our present facilities, such as a new paper machine and increased pulp making capacity, would be a further development of our Division 'B' plant. . . . In addition, we expect to build an extension to the main, Division 'A', plant for warehouse and conversion purposes.

"One of the first things we want to do is increase our sulfite pulp production to 175 tons per day. A new paper machine would give us another 65 tons of Charmin tissue, enabling us to meet the continuing increase in demand."

Revolution in the piney woods . . .

Gum Rosin's Importance to Paper Reflected in Industry's Rapid Growth

ALTHOUGH THE ANCIENT term "naval stores" is a modern-day misnomer, the naval stores industry of the Deep South sees no limit to its growth possibilities. The foreseen increase is due in large measure to the fantastically increased output of paper, for paper size is now one of the major outlets for the gum rosins produced in the piney woods of Georgia and Florida.

Few industries can trace their origins so deeply into antiquity than can the producers of naval stores. Included in the specifications for Noah's Ark were Jehovah's words of caution, "pitch it within and without with pitch."

Down through history and until the emergence of the modern steel warship, the great powers of the sea found that the fortunes of war and trade depended heavily on the forests that yielded the gum for the pitch that caulked wooden ships and preserved their rigging.

Over the Centuries, Few Changes

Until recently, the technology of the naval stores industry had changed little from that of the Gauls who worked the woods of southwestern France to supply the Roman fleet. In fact, the major change has been the switch in end use. Nowadays, the makers of naval stores are called upon to produce high-grade turpentine for the paint industry and, even more important, the gum rosin that remains when the turpentine is distilled off. From rosin they get materials for adhesives and plastics, pharmaceuticals, insecticides, linoleum, printing ink, shoe polish, soap and paper size.

Most important of all these is paper size. Of the more than 600,000 drums of gum rosin consumed in 1953-54, nearly a third went into paper and

AS A CONSERVATION measure, tree is checked to make certain it is large enough for gum production

FACE OF THE tree is smoothed with a barking tool. This used to be done with an axe, decreasing tree's value

GUTTERING IS placed below the face with double-headed nails that are driven in part way with a "raising" tool

CUP IS IN place. The nails will be removed in order to assure saving the tree for lumber or pulp

SHALLOW STREAK is cut with a bark hack. This new method in use in the South saves the entire tree trunk

GUM IS COLLECTED in a cup that is then emptied into a dip bucket. Liquid is collected and then sent to plant

paper sizing. Naval stores producers see no reason — with the incredible modern consumption of paper — why this fraction should not grow.

Integration in the Woods

And in the meantime, the industry is in the midst of a technological revolution that will get more gum out of the woods at less cost in money and manpower. Integration is the rallying cry. In other words, a way has been found to extract gum from pine trees without decreasing their value for lumber or pulpwood.

Top producing area in the United States is Appling County in Georgia, where Filtered Rosin Products Co. converts gum rosin into a variety of intermediates. It is here that Mersize, Monsanto Chemical Co.'s paper size, has been produced for the past five years. Filtered Rosin Products handles nearly 50,000,000 lb. of gum each year, controls 70,000 acres of forest lands, and does experimental work on Baxley State Forest.

In this area can be seen the grievous scars left by the early harvesters of naval stores in this country. Trees are blazed "knee high and belly wide" according to the now outmoded theory. These woodsmen didn't care. They chopped deeper and higher as they ranged from Virginia north to New England after 1620 and south to North Carolina in 1665 and even west to Louisiana and Texas. When these resources were spent, they returned to the second-growth slash pine in Florida and Georgia, where they discovered that the new-growth trees had a greater percentage of sapwood than virgin trees and thus produced more gum.

SQUIRTING SULFURIC acid solution on face keeps resin ducts open and guarantees more future production

The Modern Methods

Gum from the woods is brought to collection points scattered throughout the area. It reaches the plant in lots that range from 5-gal. tins to drums containing 400 to 600 lb.

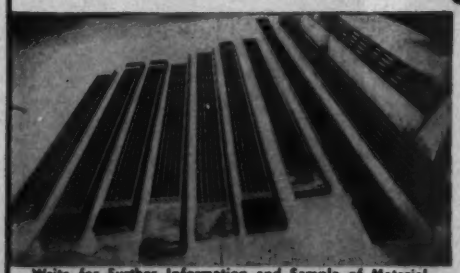
The gum is treated at these plants using what is known as the Olustee process, which washes the material before steam distilling it. FiltRos has added its own techniques, including pre-distillation filtration, and as a result achieves a high-quality rosin. According to the firm, present grading methods don't really show how superior it is. The grading system is one of the few past inheritances.

Starting with the paler shades and grading downward to the dark ones, rosin is classified as Extra, Walter White, Window Glass, Nancy, Mary, Kate, Isaac, Harry, George, Frank, Edward, Dolly and Betsy. With improved techniques, the darker shades have been disappearing. FiltRos turns out almost no rosin darker than Mary, and most of its production is Walter White, Window Glass and Nancy.

The process begins in four dump vats, each of which will hold 1250

RES-LIN wire saver
SUCTION BOX COVERS
are
PROVEN by TEST

PROVEN BY TEST, this RES-LIN Suction Box Cover is establishing a new record for longer life and even wearing. It is engineered to meet the requirements of specific production problems of each particular paper machine.



Write for Further Information and Sample of Material

WIRE RES-LIN SAVER

APPLETON WOOD PRODUCTS CO
APPLETON, WISCONSIN

10 Reasons Why You Should Use RESLIN

1. Even distribution of fabric assures EVEN WEARING.
2. Ends of threads contact wire, assuring uniform surface to wire.
3. Increased wire life.
4. Many years of trouble-free service.
5. Resurfacing reduced to a minimum.
6. Expansion and contraction is reduced to a minimum.
7. Reslin can supply a greater open area without sacrificing strength.
8. Requires no wet storage or care when machine is down.
9. Easily installed.
10. No other can offer as even-wearing and wax-like surface as Reslin.

barrels of gum. It is then fed to the gum processing plant, where turpentine dilutes it before the material is melted, filtered and washed.

The clean gum then enters an automatic continuous process still, where steam distills off the turpentine and the rosin. Some of the latter, after grading, is shipped as is in bags, drums or tank cars. The remainder is made into specialty products, such as Monsanto's Mersize, in the FiltRos synthetics plant. A modern laboratory checks the output of both plants, working meanwhile to develop more specialty resins from the natural rosin.

Kimberly-Clark and International Cellucotton Announce Merger

Directors of International Cellucotton Products Co. of Chicago and Kimberly-Clark Corp. of Neenah, Wis., have approved a plan for the complete integration of the two firms. The proposal was to be submitted during August to the stockholders of the respective companies.

If the consolidation takes place, the joint activities will be under the direction of Kimberly-Clark.

International Cellucotton controls the processing and distributing rights to Kleenex, Delsey and various other tissue and absorbent products.

New K-C General Offices

A building permit to Kimberly-Clark has estimated at $900,000 the construction cost of its proposed main office building that will be built adjacent to its Lakeview mill.

The steel-and-concrete structure will consist of two sections: one two-story wing measuring 80 by 200 ft., and one one-story wing measuring 150 by 500 ft. Included will be a 63- by 140-ft. cafeteria for employees.

St. Regis to Acquire General Container

St. Regis Paper Co. and General Container Corp. of Cleveland have jointly announced that holders of substantially more than the majority of General's outstanding capital stock have signed an agreement granting St. Regis options to acquire their shares in exchange for shares of St. Regis common.

St. Regis will make an offer to all holders of General's capital stock to

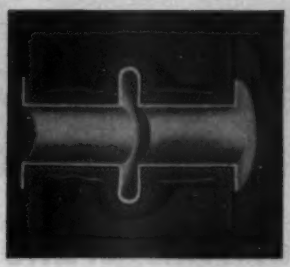
Spool-type Rubber Expansion Joint

Rectangular-type Rubber Expansion Joint

U-type Rubber Expansion Joint

There's a GARLOCK EXPANSION JOINT for your piping applications

All-Teflon* Expansion Joint



Rubber Expansion Joint with Teflon liner

Expansion Joint for use on Haveg and Duriron piping

- **To stop vibration, flange breakage**
- **To relieve stresses and strains in piping and equipment**

Garlock manufactures a *complete* line of expansion joints specifically designed to meet the requirements of different types of service. **Rubber Expansion Joints** are made in all pipe sizes from ¾" to 72" for water, air, or exhaust steam. They are furnished in round, rectangular, tapered or offset; spool-type and U-type.

All "Teflon" Joints or **Rubber Joints with Teflon liner** are made for chemical service; **Neoprene Joints** for oil service. Specially designed Rubber Expansion Joints are now available for use on piping and flanges made by **Haveg Corp.** and **The Duriron Co., Inc.**

Write today for Expansion Joint Folder AD-137.

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GARLOCK

PACKINGS, GASKETS, OIL SEALS,
MECHANICAL SEALS, RUBBER EXPANSION JOINTS

Look Overhead . . . see "NORTHERN"

Paper Mill Crane designed for future wider span

This 59-foot span NORTHERN CRANE was recently installed in a newly built paper mill in North Carolina.

To provide for a possible future expansion and rebuilding of this mill, the crane has been designed and built so that it may be lengthened to approximately double this original span.

This installation reflects Northern's long, comprehensive experience in designing and building overhead electric cranes to deliver the particular services required by the paper mill industry; and to assure fast, safe, dependable operation in the wider bay buildings now preferred for industrial manufacturing.

Let us send you Bulletins G-700 and HL-115

NORTHERN | MATERIALS HANDLING EQUIPMENT

NORTHERN ENGINEERING WORKS
210 CHENE ST., DETROIT 7, MICH.

exchange their shares for St. Regis common stock on the same terms as the present options. Under the terms of the offer, the holders of General's capital stock would receive 2-3/8 shares of St. Regis common for each share of General.

General is engaged in the manufacture of corrugated fiber shipping containers and allied products, folding cartons and set-up boxes, and corrugating medium and container chipboard.

General's nine plants, in addition to the one at Cleveland, are located in Cohoes and Buffalo, N. Y.; Canton and Coshocton, Ohio; Dubuque, Iowa, and Marshall, Michigan.

Molded Pulp Firm Proposed by Milwaukeean

Plans which would make Milwaukee the capital of the molded paper pulp industry have been announced by Murray W. Bohlmann, founder of Universal Distributing Co., who has proposed the incorporation of a firm to be known as Universal Pulp Products Corp.

Universal Pulp Products would serve industry and business with the latest developments in the molding of paper pulp containers and similar products from high-grade waste paper and other raw materials that have potentialities.

Certain of the products to be manufactured would be impregnated with plastics in order to impart tough wall strength and high impact value.

Mr. Bohlmann envisions a 100,000-sq. ft. plant with adequate land area for eventual expansion to 300,000 sq. ft. Estimated cost of the project is $1,300,000. (For the past five years, Mr. Bohlmann has been general manager and sales manager of Keiding Paper Products Co., largest producer of molded paper products for the florist industry.)

Opaque Waxed Paper Called Good Vitamin Protection Medium

That opaque waxed paper gives superior protection to the vitamins in enriched bread when compared to any clear transparent film was the finding of a two-year research study recently completed by Foster D. Snell Inc.

The study revealed that the superior light-barrier properties of waxed paper preserve for longer periods the riboflavin (Vitamin B2).

A highlight of the report was the documented evidence indicating that the waxed paper keeps out over 79

per cent more of the vitamin-damaging light rays from loaves of white enriched bread than do the wrappers of the clear transparent type.

According to the Snell laboratories, after maximum probable exposure to diffused daylight and/or fluorescent light under normal commercial conditions for the bread, opacity provides twice the protection of transparency.

Western Michigan College Gets Funds for Structure

Much needed space for paper technology studies at Western Michigan College in Kalamazoo is being carefully studied as a result of the recent action of the state legislature voting $100,000 for the construction of added facilities. The $100,000 must be augmented by a similar amount from industry.

A three-story addition to McCracken Hall is to be constructed. Dr. A. H. Nadelman, head of the paper technology department, is working closely with the architect and college officials to bring the addition into being as soon as possible.

Preliminary drawings place a large lecture room seating 156 on the ground floor level, along with a projection room and a machine shop. On the first floor above will be a pilot area, testing and bleaching laboratories, library and seminar room and an advanced laboratory. There will also be a pilot laboratory measuring 26 by 65 ft., the center portion of which will be two stories high. Access to the machine shop immediately below will be possible.

On the top floor will be two classrooms seating 30 and 40 students, a microbiology and microscopy laboratory, two advanced laboratories, and an office for the supervisor of the pilot lab.

Paper Raincoat Patented

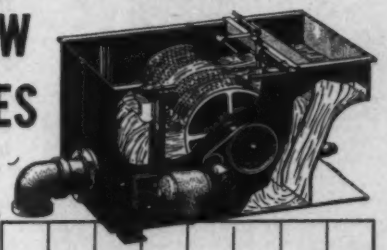
An enterprising Puerto Rican inventor has come up with a paper raincoat designed to be sold in vending machines and thrown away after one use.

One of 596 inventions to receive a patent during a recent week, the disposable raincoat is made of either waterproofed or glossy wax paper, is fashioned in three sizes and can be adjusted to the wearer's size. It also features a hood.

Now...in Bowaters Southern Paper Corporation's New Plant...

ASKANIA CONSISTENCY REGULATOR

FOR AUTOMATIC CONTROL OF SULPHATE AND SULPHITE STOCK AT LOW CONSISTENCIES



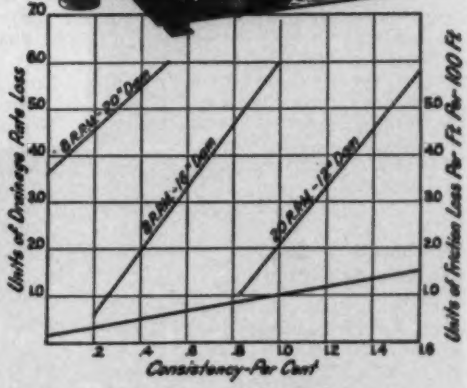

Units of Drainage Rate Loss
Units of Friction Loss Per Ft. Per 100 Ft.
Consistency-Per Cent
8 R.P.M.-10" Drop
8 R.P.M.-1" Drop
80 R.P.M.-1" Drop

Chart illustrates Drainage Rate Principle—only accurate measure of consistency in thin stock range below 1.5% available. Rate change of friction loss (black line) is low ...rate change of head (gray line) is high for same consistency change.

With the Askania Consistency Regulator, consistency can easily be changed to give the optimum for each screen or decker. Differences in digester cookers and washings can be compensated over wide ranges. Operation of screen or decker at maximum rating is assured—no need to set flow below capacity to eliminate flooding.

The consistency recorder gives a minute to minute record as well as a complete record of each 24-hour period. Only 75 gallons per minute pass through regulating system . . . sample is used to control main supply line. The Askania consistency regulator can easily be added to present equipment, is self-cleaning and operates at low cost. *Write for bulletin 145.*

ASKANIA REGULATOR COMPANY
2788 E. Ontario Street, Chicago 11, Illinois
Subsidiary of General Precision Equipment Corp.

ALLIED NEWS

Downingtown Appoints Research Organization

Downingtown Mfg. Co., of Downingtown, Pa., has appointed L & O Research & Development Corp. of Wayne to conduct basic research related to papermaking. Intended to supplement the work of Downingtown's own research and development group, the studies will include a re-evaluation of existing findings, as well as considerable original research. Investigations are now in progress in the field of stock formation.

Nopco Plans Expansion; Acquires Griffin Chemical

Anticipating a 25,000 per cent increase in the demand for foamed plastics in the next five years, the board of directors of Nopco Chemical Co. of Harrison, N. J., has established a Plastics Div. and "given the authority for a $1,000,000 expansion program of its facilities and organization."

In another expansion move, Nopco has acquired the assets of Griffin Chemical Co. of San Francisco. Griffin is a manufacturer of substantial tonnages of petroleum sulfonates, napthenic acid, emulsifiers, plasticizers, and polyvinyl acetate emulsion.

Reichhold to Build Sulfuric Acid Plant

Reichhold Chemicals Inc. has revealed plans for the construction of a 100-ton sulfuric acid plant in Tuscaloosa, Ala. According to P. J. Ryan, vice president in charge of the Southern Div., completion of the new facility is expected in the spring of 1956.

The project with auxiliaries will represent an expenditure of an estimated $800,000. The output of the new operation will be consumed by Reichhold's present Tuscaloosa plant.

Allied News Notes . . .

Cuno Engineering Corp. has named Control Equipment Co. of Atlanta, Ga., as exclusive sales representative for its line of industrial products.

Officers of **Hooker Electrochemical Co.** and of **Niagara Alkali Co.**, both of Niagara Falls, N. Y., have announced that they are negotiating for a merger of Niagara Alkali into Hooker Electrochemical.

Cochrane Corp. of Philadelphia has announced the appointment of Dickey Engineering Co., of Knoxville as sales representative in Tennessee.

The Organic Chemicals Div. of **Monsanto Chemical Co.** has announced that the delivery time on fortified rosin size to paper firms in the Northeast will be reduced 50 to 75 per cent when the new Fieldsboro, N. J. plant for the production of Mersize and related products begins operations in the fall.

ACF Industries Inc. has reported that the board of directors of Key Co. of East St. Louis, Ill., has opproved ACF's offer to purchase Key's assets. The firm makes oil refiinery, chemical plant and power plant equipment.

National Starch Products' second polyvinyl resin plant was to begin operations in Meredosia, Ill., in July.

Byron Jackson Co. has announced the reorganization and expansion of its Mechanical Seal Product Div. to meet "a constantly rising demand" for the product.

American Pulley Co. of Philadelphia has purchased from Standard Pressed Steel Co. of Jenkintown, Pa., the rights, tooling, equipment and inventory for the latter's line of pressed-steel platform trucks, marketed for the past 27 years under the trade name, "Hallowell."

THE WORKINGS of the Lowther tree planter are explained to E. H. Neese (l), chairman of Beloit Iron Works, by William Sylvester, forester for Trees for Tomorrow

Beloit Iron Takes Part in Tree-Planting Effort

Beloit Iron Works of Beloit, Wis., has recently completed the planting of 20,000 Norway pine and Norway spruce seedlings on property near its plant. The trees were set out in cooperation with Trees for Tomorrow Inc.

The seedlings were purchased from the Nepco Lake nurseries of Nekoosa-Edwards Paper Co. The actual planting was done by a mechanical tree planter at a rate of 1000 per hour.

Flexonics Corp. of Maywood, Ill., has appointed two exclusive sales representatives: Joseph A. Schramm of St. Louis and Bushnell Controls & Equipment Co. of Los Angeles.

The executive offices of **Pennsylvania Salt Mfg. Co.** and headquarters of its operating divisions have been moved from the Widener Bldg. to 3 Penn Center Plaza in Philadelphia.

B. E. Prevost

R. L. Draper

Bolton Promotes Two

The promotion of Bruno E. Prevost to the position of vice president for manufacturing has been announced by John W. Bolton & Sons Inc. of Lawrence, Mass. At the same time, Ralph L. Draper was named to the newly created position of company chief engineer.

Mr. Prevost has been general manager of Bolton's Emerson Div., while Mr. Draper was formerly production manager of the Bolton plant.

The new vice president joined the firm in 1944 and has been responsible for several important patents in the development of the Bolton automatic plug pressure control system, as well as magnetic separators and magnetic traps, jordan safety plug positioners, carbide inserted spray nozzles, etc. A native of Canada, Mr. Prevost was at one time associated with Union Bag & Paper Corp.

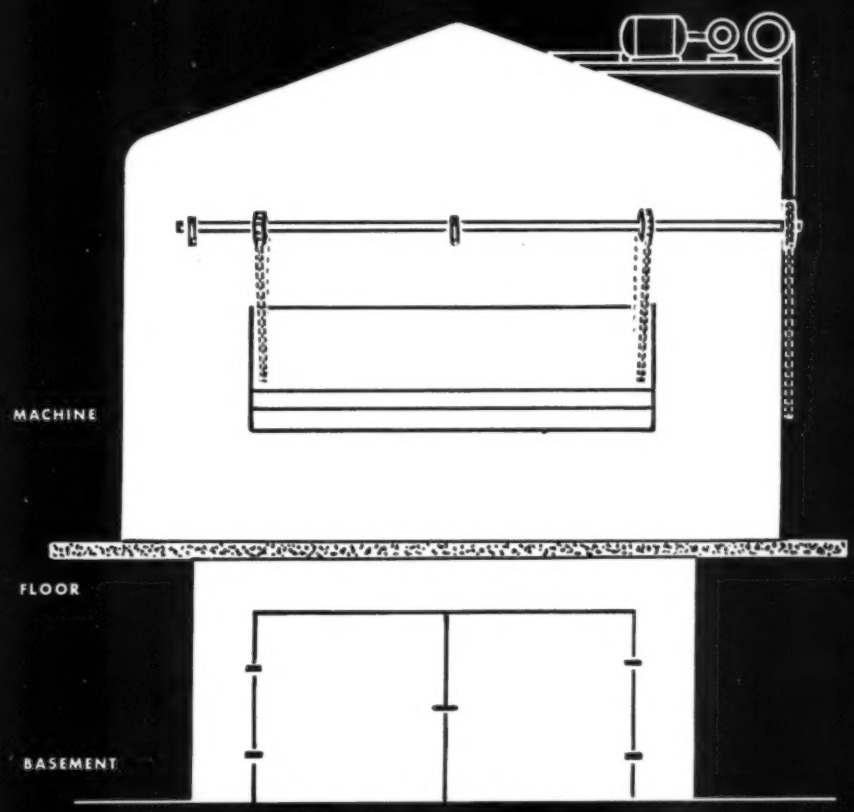
Allied Personalities . . .

George S. Edwards of Birmingham, Ala., has been named by Cuno Engineering Corp. as exclusive sales representative for its line of industrial fluid and gas filters. His territory includes Alabama, parts of western Florida and central Tennessee.

Carl W. Eurenius, director of sales for Hercules Powder Co.'s cellulose products department since 1948, has been appointed assistant general manager of the department. At the same time, **Werner C. Brown,** an assistant director of sales, was named to succeed Mr. Eurenius.

George S. Trees, a director of Chicago Bridge & Iron Co., has been named manager of the firm's Pittsburgh sales office. Formerly assistant general sales manager, Mr. Trees succeeds George S. Sangdahl, who died June 13.

Carlton F. Diskin has been elected a vice president of Gottesman & Co. Mr. Diskin has been associated with the pulp and paper industry 15 years.



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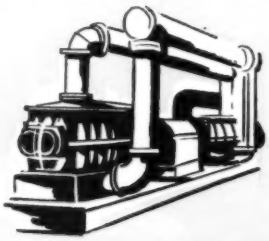

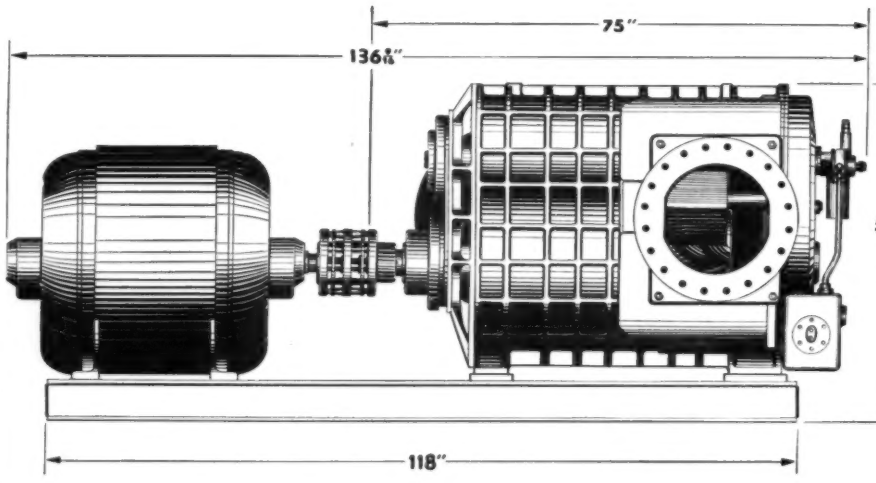

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1200 RPM

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NAMES *in the* NEWS

Parker Retires at K-C; Picked to Head NAM

C. G. Parker

Cola G. Parker has retired as chief executive officer of Kimberly-Clark Corp. He has been succeeded as chairman of the board by John R. Kimberly, who has been president since 1953 and will continue to serve the company in that capacity.

Mr. Parker, who will continue as a K-C director, is vice president of the National Association of Manufactures and is slated to become president in 1956. He joined Kimberly-Clark in 1937 as a vice president, director and member of the executive committee. He was elected president in 1942 and has been the chief executive officer during the 13 years of the firm's greatest expansion.

Prior to his direct association with the Neenah, Wis. firm, Mr. Parker represented the corporation and other paper companies as a member of the New York, N. Y. law firm of Whitney, Wise & Parker. A graduate of the University of Chicago in 1911, he practiced law there until World War I, when he enlisted in the AEF.

Mr. Kimberly, the new board chairman, has been associated with Kimberly-Clark for 30 years. He was vice president in charge of sales from 1942 to 1953. A grandson of one of the founders of the firm, he is the fourth president in its 83-year history.

In his 11 years as Kimberly-Clark president, Mr. Parker directed an expansion program that saw the establishment of new mills at Terrace Bay and Kapuskasing, Ont.; Coosa Pines, Ala., and Memphis, Tenn. A mill was acquired at Munising, Mich., and existing plants at Niagara, Neenah, Appleton and Kimberly, Wis., and Niagara Falls, N. Y., were enlarged.

Mr. Parker is president of Kimberly-Clark Corp. of Canada Ltd., president of LongLac Pulp & Paper Co. Ltd. and a director of Spruce Falls Power & Paper Co. Ltd. He has served twice as president of the APPA and as chairman for two terms and vice chairman for four of the National Industrial Conference Board.

Robertson Gets Govt. Post

Reuben B. Robertson Jr., president of Champion Paper & Fibre Co. of Hamilton, Ohio, has been named Deputy Secretary of Defense. He succeeds Robert B. Anderson, who has announced his resignation.

Mr. Robertson in his new post will be No. 2 man in the Department of Defense under Defense Secretary Charles E. Wilson. He becomes one of the youngest high officials in the Eisenhower administration.

A native of Ashville, N. C., Mr. Robertson's grandfather, the late Peter G. Thompson, established what is now known as Champion Paper & Fibre in 1893. He began his career with the firm in 1930 and in 1950 was elected president to succeed his father, Reuben Robertson Sr., who was named chairman of the board.

R. B. Robertson Jr.

W. F. Bowld

Bowld Retires at Buckeye

William F. Bowld has retired as general manager of the Buckeye Cellulose and Specialties Div. of Proctor & Gamble Co. He has been succeeded by W. L. Lingle, P & G executive vice president, who is adding to his present responsibilities those formerly administered by Mr. Bowld.

Mr. Bowld, who this year completes 35 years with the firm, will continue to serve the company on a part-time, special assignment basis. He joined the P&G organization in 1920, became a vice president of Buckeye Cotton Oil Co. in 1941 and assumed the duties of Buckeye Cellulose manager in 1953.

Clarence Larson (above, l)

E. L. Lamb (above, r)

J. H. Davidson (right)

Promotions at Mando

Executive management promotions and a reorganization of engineering functions were recently announced by Minnesota & Ontario Paper Co.

Personnel moves involve the appointment of Clarence Larson to the position of vice president in charge of operations, the advancement of E. L. Lamb to director of manufacturing, and the creation of a Central Engineering Div. to be headed by J. H. Davidson, chief engineer.

As vice president in charge of operations, Mr. Larson will be directly accountable for the accomplishment of all company plans and objectives for the pulp, paper, and Insulite plants and subsidiary operations at International Falls, Minn., and Fort Frances and Kenora, Ont. He will be responsible for the operation and maintenance of the properties under his supervision, plus other broad responsibilities, including forest management and pulpwood supply, personnel and community relations.

As director of manufacturing, Mr. Lamb, formerly production assistant to the executive vice president, will now be responsible for broad techni-

cal coordination between production, sales, engineering, research and purchasing.

In other Mando appointments, C. J. Kusnierek, formerly resident engineer at International Falls, has been named chief construction engineer; and T. B. Harrison, formerly resident engineer at the company's Fort Frances mill, has been appointed chief process engineer for the newly created Central Engineering Div.

L. G. Lea, vice president of Kieckhefer Container Co. of Camden, N. J., has been appointed deputy director of the containers and packaging division, Business and Defense Services Administration, U. S. Department of Commerce. He has been with Kieckhefer since 1920.

Maass Joins Canadian Research Council

Dr. Otto Maass has joined the National Research Council of Canada as a principal research officer in the Division of Pure Chemistry. Since 1940, he has been general director of research for the Pulp and Paper Research Institute of Canada.

Dr. Maass, who has retired as Macdonald Professor of physical chemistry and head of the department at McGill University, will do research in physical chemistry along any lines he chooses.

A Fellow of the Royal Society of London, Dr. Maass has been recognized by the United States government by the award of the Medal of Freedom with bough.

Names in the News . . .

Andrew J. Schroder II, secretary of Scott Paper Co. and director of industrial relations, has been elected a vice president. He joined Scott in 1937 as a legal assistant. He will continue in charge of industrial and public relations.

A. J. Schroder II

G. D. Sturgeon

G. David Sturgeon has been promoted to superintendent of maintenance for Paterson Parchment Paper Co. at Bristol, Pa. He joined the firm in 1953.

Vincent H. Urquhart, formerly manager at the Aurora, Ill. plant, has been named production manager of National Container Corp.'s Long Island City, N. Y. converting operation. He entered the industry in 1929 and was with Seaboard Container Corp. prior to joining National Container.

George W. Mead II has been appointed assistant production manager of the Wisconsin Rapids Div. of Consolidated Water Power & Paper Co. A graduate of the Institute of Paper Chemistry, he joined the firm in 1952 as a sulfite mill chemist and was later named chief of pulping research. Since November 1954 he has been director of product development.

Leon Settles has been named plant manager of the Walloomsac Div. of

"From ingot to fourdrinier wire"

QUALITY-CONTROL THROUGH THE LABORATORY

Shown here is a small section of our laboratory, which is housed in its own building and is completely equipped with the most modern instruments.

Its staff is dedicated to a two-fold purpose:

1. *Quality control during every phase of fourdrinier wire manufacture.*
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From the raw metals to your finished fourdrinier wires, we are proud to say they are *truly ours*—scientifically controlled from the ingot to the finished product.

EASTWOOD-NEALLEY CORPORATION
Belleville, N. J.

Columbia Box Board Mills Inc. in Chatham, N. Y. Mr. Settles has been with the firm since 1949 and now holds the office of assistant treasurer. In another promotion, **Angelo Ambrosio** has been named superintendent at Walloomsac. He was formerly assistant superintendent.

Albert H. Carroll has retired as paper mill superintendent at the Racquette River Paper Co. in Potsdam, N. Y. He had held the position since 1925.

Tom Ziliox, coordinator of waste control since 1952, has been named coordinator of waste and finishing cost controls for Champion Paper & Fibre Co. at the firm's general office in Hamilton, Ohio. His new assignment is company-wide in scope and is under the supervision of Leo Geiser, director of the general production department.

Alfred J. Barchi, plant engineer for Doeskin Products Inc. at Rockland, Del., has been named plant manager.

Everett I. Morse, central paper buyer for Bemis Bros. Bag Co. in Boston, has been named to the new post of director of paper procurement. He joined the firm in 1925.

Necrology . . .

Donald Rochester

Donald Rochester

Donald Rochester, head of the community relations program and secretary of the American Paper & Pulp Association, died unexpectedly July 3 in Cadillac, Mich., where he had been vacationing. He was 51.

A former Cadillac school teacher, Mr. Rochester was at one time a member of the Michigan Division of Conservation.

George C. Borden Jr.

George C. Borden Jr., technical director of Riegel Paper Corp., died at his Milford, N. J. home July 8. He was 54.

Mr. Borden, who headed the firm's research and development program, was graduated as a chemical engineer from Lehigh University in 1924. Over a period of many years, he had served on numerous committees of such organizations as APPA, Tappi, and the Glassine and Greaseproof Association.

Hyman R. Sweet, 51, executive vice president of Chippewa Paper Products Co. Inc. of Chicago, died June 17. He became associated with Chippewa Paper Products in 1945, prior to which he had been an executive for a Milwaukee paper products firm.

John A. Heeder, 61, vice president and secretary of Fort Orange Paper Co. at Castleton-on-Hudson, N. Y., died July 1 in Albany. He had been with the firm 30 years.

James O. Smith, 57, sales representative for the Organic Chemicals Div. of North American Cyanamid Ltd., was killed in an automobile accident near Markham, Ont., recently.

Edwin A. Russell, vice president and director of Philadelphia Quartz Co., died June 27. He was 66 and had been with the firm since 1918.

Joseph D. Meadon, 46, for many years associated with the Production Management Div. of the Champion Paper & Fibre Co., died recently in Hamilton, Ohio.

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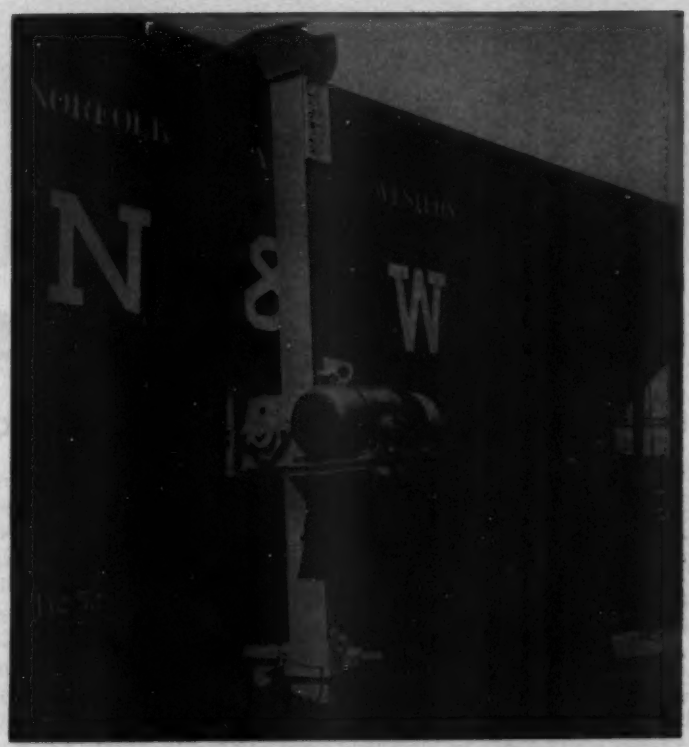

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PATENT REVIEWS

MELVIN NORD*

Device for magnetically shaking the forming wire of fourdrinier machines

In order to counteract the tendency of the fibers of a paper stock to orient themselves in the direction of the wire in motion, a shaking motion may be given to the suspension in order to obtain a more uniform deposition of lengthwise and transverse fibers.

In U.S. 2,699,709, issued Jan. 18, 1955, to Ernst W. Breuning, Hans J. Karpinski and Henrich O. Morike, and assigned to Papierfabrik Scheufelen, the shaking action is obtained by providing a transverse magnetic field which is provided by a pulsating or alternating electric current. In this way, only the comparatively light wire cloth is caused to vibrate, instead of the customary large masses of metal. As a result, excessive wear in bearings is avoided, and power requirements are reduced.

Method of treating waste sulfite liquors

In U.S. 2,699,998, issued Jan. 18, 1955, to Avery A. Morton, and assigned to Penobscot Chemical Fibre Co., waste sulfite liquor is treated with an aliphatic alcohol such as t-amyl alcohol or isopropyl alcohol. This causes the separation of two liquid phases, one an alcohol-water liquid fraction and the other an aqueous-solids fraction containing virtually all the original solids components of the waste liquor. Under certain conditions, the calcium salts can be precipitated out, instead of remaining in solution.

Production of sized alkaline paper

U.S. 2,694,629, issued Nov. 16, 1954, to Walter F. Reynolds Jr., and assigned to American Cyanamid Co., discloses a new method of sizing paper. The method involves sizing paper by an absorbed content of 0.1 to 5 per cent of the dry weight of a water-soluble initial condensation product of from 1 to 2 moles of epichlorohydrin with 1 mole of an aliphatic amine containing from 16 to 22 carbon atoms and heated at 100-150°C. for ½-3 minutes.

Acid sulfite pulping

U.S. 2,698,234, issued Dec. 28, 1954, to Stewart E. Seaman (White Plains, N.Y.), provides a process for the production of sulfite pulp which results in a pulp having a higher percentage of alpha cellulose than usual. It also results in considerable saving in time and in the cooking liquor.

The digester is charged with chips and with a cooking liquor containing 2 per cent of bisulfite expressed as SO_2 and at least 3 per cent of H_2SO_3 expressed as SO_2. Hydraulic pressure is applied to the digester until the chips are completely impregnated with the liquor. The free liquor is then withdrawn from the digester, and steam is admitted. A vapor temperature of 170°C. is maintained until the chips are cooked, which takes about an hour.

The liquor withdrawn is clean and can be re-used in the next batch. The amount of cooking liquor discharged as waste is consequently reduced. There is also a substantial saving in steam.

Abrasive buffing of the surface of paper

Increased surface glossiness is produced by buffing a paper surface with the composition described by Robert S. Ellis in U.S. 2,696,151. The patent was issued Dec. 7, 1954, and assigned to S.D. Warren Co. (Boston, Mass.).

The paper is first treated by a supercalender to render it smooth and level. The smoothed surface is then subjected to the polishing or buffing action of a resilient roll carrying a layer of an abrasive composition.

The buffing composition consists of water, abrasive powder (e.g. powdered silica) and a water-soluble adhesive and lubricant (polyethylene glycol). The aqueous slurry can be picked up by a solid roll which turns in the slurry, and it can be removed by a rotating brush which transfers the slurry to a rotating buffing roll. The quantity of abrasive applied to the buffing roll can be controlled by regulating the speed of rotation of the first roll.

Cylinder papermaking machine

In a cylinder board machine, stock is fed to a vat circle in a relatively quiescent condition, since turbulence in the feed from the feed box interferes with uniform deposition of the web on the cylinder mold. In maintaining such a quiescent condition in the feed box, difficulty is experienced because the stock tends to settle out, to clot, or lump and in general to become non-uniformly distributed through the width of the feed box.

In U.S. 2,701,988, issued Feb. 15, 1955, to Robert F. Hollis, and assigned to Alton Box Board Co., a solution to this problem is presented. According to the inventor, it has been discovered that uniform quiescent

Other Patents of Interest to the Pulp and Paper Industry

Subject	Inventor or Assignee	Patent No.	Date
Corrugated paperboard pallet	International Paper Co.	2,691,500	"
Electrolytic recording paper	Faximile Inc.	2,692,228	10/19/54
Microbiocidal water treatment for paper mill white water	California Research Corp.	2,692,231	"
Cardboard bottle carrier	Empire Box Corp.	2,692,700	10/26/54
Paperboard bottle carrier	Stephen Lighter	2,692,701	"
Shipment corner protector of corrugated fiberboard sheet material	Menasha Wooden Ware Corp.	2,692,720	"
Closure and fastener for cartons	O. B. Andrews Co.	2,692,721	"
Container with cover lock	Container Corp. of America	2,692,722	"
Sizing paper pulp	A. M. Meincke & Son, Inc.	2,692,824	"
Sealing means for cylinder papermaking machines	The Black-Clawson Co.	2,695,550	11/30/54
Dispensing carton with gable top	Ex-Cell-O Corp.	2,695,745	"
Tuck-in-sleeve	Raymond Bag Co.	2,695,746	"
Suction molding machine	Chapman Forest Utilization Inc.	2,696,146	12/ 7/54
Combined fluid pressure and suction press	Beloit Iron Works	2,696,148	"
Apparatus for equalizing tension on webs	Western Electric Co., Inc.	2,696,192	"
Bottle carrier	Robert Gair Co. Inc.	2,696,341	"
Beating engine for paper pulp	McNeill Winterburn Inventions Ltd.	2,696,767	12/14/54
Collapsible bottle carrier	The Gardner Board & Carton Co.	2,696,942	"
Container construction	Camden Bag & Paper Co.	2,696,943	"
Article carrier	Morris Paper Mills	Re. 23,912	12/21/54
Dry process of manufacturing pressboard	Bruce A. Gordon	2,697,254	"
Double shell drier roll construction	Lukens Steel Co.	2,697,284	"
Compartmented box	Emil Morand	2,697,544	"
Pilferage inhibiting shipping container	Victory Container Corp.	2,697,545	"

*Patent attorney, 17600 Pinehurst, Detroit 21

flow of stock from the feed box can be accomplished without settling or segregating by providing a vertical passageway with a venturi throat through which all of the stock must pass. The cross-sectional area of the venturi must be about one-sixth that of the vertical passageway. The venturi throat discharges into an open-topped chamber directly feeding the making board or weir discharge to the vat circle.

Because of the increased velocity in the venturi throat, separation of fibers is prevented. In addition, the venturi throat acts as a stock spreader as well as a stock mixer.

The patent describes an apparatus based on this principle.

Chemical ash dissolving tanks for black liquor recovery units

U.S. 2,702,235, issued Feb. 15, 1955, to Frank W. Hochmuth, and assigned to Combustion Engineering Inc., describes an apparatus for continuously dissolving the ash which remains after combustion of black liquor in a waste heat boiler.

Method of analyzing a web of paper

U.S. 2,704,453, issued March 22, 1955, to Harold M. Davis and assigned to Precision Paper Inc., describes an accurate method of sampling a web of paper produced on a fourdrinier machine, in order to determine the existence and extent of variations in base weight across the web.

The inventor states that he has found permanent heavy and light streaks running for mile after mile of the length of the web, as well as a reoccurring cycle of basis weight variations in any line of the web, each cycle corresponding to about 5 seconds of machine running time. In addition, he has found a third type of basis weight variation which is a flash but random variation, in which as many as nine "tracks" (each 6 inches wide) combine for about one second.

On the basis of these findings, the inventor proposes the following method of sampling in order to determine basis weight variations: He cuts strips of paper from the outer 8 convolutions of a reel of paper, each strip being 6 inches wide and 18 inches long. Each such sample has the same area as the common 24x36 inch sample and is weighed on customary ream scales. In this way, fluctuations over the 5 second cycle are averaged out and, furthermore, undesired averaging of the "hills" and "valleys" of adjacent narrow "tracks" is avoided.

Quality must be constructed into Fourdrinier wires, not inspected into them. A portion of every day's wire production is tested mechanically as well as metallurgically. The process must be kept in control; uniformity must be acceptable for weaving. The Lindsay Wire Weaving Company, Cleveland 10, Ohio.

LINDSAY WIRES Since 1904

FOR PAPER MANUFACTURING

Patent Reviews . . .

Process for making hard, abrasion-resistant paperboard

U.S. 2,704,736, issued March 22, 1955, to Norman Greenberg and Walter S. Greenberg, and assigned to Kiddy Case Mfg. Co. Inc., provides a method of producing a paperboard which has exceptional strength, hardness, and resistance to abrasion, and which is highly resistant to fire.

Sheets of cardboard are immersed in an aqueous solution of acetic acid for 24 hours to thoroughly saturate the fibers, after which the cardboard is dried for a day at room temperature. The dried cardboard is then immersed for 24 hours in a urea resin solution containing both dimethylurea and urea, after which it is dried for 12 hours at room temperature.

The impregnated sheets are then stacked and subjected to heat and pressure to form a laminated board or sheet product. No adhesive is required in this step, since the sheets adhere to each other with great strength.

It is found that objects produced in this way are virtually flameproof and fireproof, and have a high smoldering temperature.

Process of making hardboard

U.S. 2,703,293, issued March 1, 1955, to Robert M. Boehm and Harold R. Hunt, and assigned to Masonite Corp., describes a process of improving the properties of hardboards.

The improvement consists of first impregnating the boards with lignin and then drying with siccative oil (e.g. Velsicol). Finally, the board is baked for 2-7 hours in the presence of air at about 200°C.

As an example of the improvement in properties, the modulus of rupture was improved from 6380 to 11,000 psi., and the percent water uptake during 48 hours was reduced from 19.8 to 16.4.

Water drainage pit for a fourdrinier machine

U.S. 2,706,434, issued April 19, 1955, to Karl O. Elderkin and assigned to Crossett Lumber Co., describes a water drainage and recirculation system at the wire pit of a fourdrinier machine of the type operating at high wire speed and using a pressure type head box.

The primary object of the invention is to achieve a more uniform flow of stock at constant velocity from the head box onto the fourdrinier wire, so that the sheet of paper formed on the wire at high speed will be of uniformly constant thickness.

Irregularities in the paper formed on the fourdrinier wire result principally from pressure pulsations at the head box, caused by entrained air in the recirculated water passing through the pump. In the device described, turbulence in the water flow which causes air entrainment is greatly reduced, and whatever air is entrained is given the opportunity to escape during a slow initial descent of the water in draining from the pit. A high static water pressure is imposed on the suction side of the pump to minimize the effect of whatever air may still be retained.

Sizing compositions

U.S. 2,705,205, issued March 29, 1955, to Robert D. Sullivan and assigned to Shell Development Co., describes a sizing composition which minimizes or eliminates the use of rosin.

Petroleum residues consisting primarily of aromatic and naphthenic hydrocarbons with a boiling point of at least 300°F at 1 mm. Hg. (e.g. residual asphalt) constitute 30-85 per cent of the sizing composition.

The second component (present in the amount of 5-40 per cent) is a wax having a melting point of 160°F or more and containing at least 80 per cent of paraffin hydrocarbons.

The third component is an emulsifying agent, such as sodium oleate, etc.

The sizing composition is combined with water to form an emulsion.

Waste Paper Recovery

(Continued from page 435)

thus saving one more job for the paper mills.

Paper is loaded into rail cars which are of about 50 cu. ft. capacity, the weight noted, and the contents dumped into the vacuum container (converter). This is Step 1 as illustrated in the sketch. The process in the vacuum container is Step 2. The conveyor system (water-covered to keep the swelling at the vacuum-produced level) leading to the coarse, or main disintegrator is Step 3.

The main disintegrator with its turbulence-system is Step 4. After the crude separation of the cellulose fibers from foreign particles, the pulp is carried over a second conveyor belt system (Step 5) to the 12 fine micro grade disintegrators. In the sketch, only three divisions of the micro-grade disintegrator are shown as Step 6. Below the rectangular disintegrator chambers, a triangular tank is mounted where the dehydration and later grading take place.

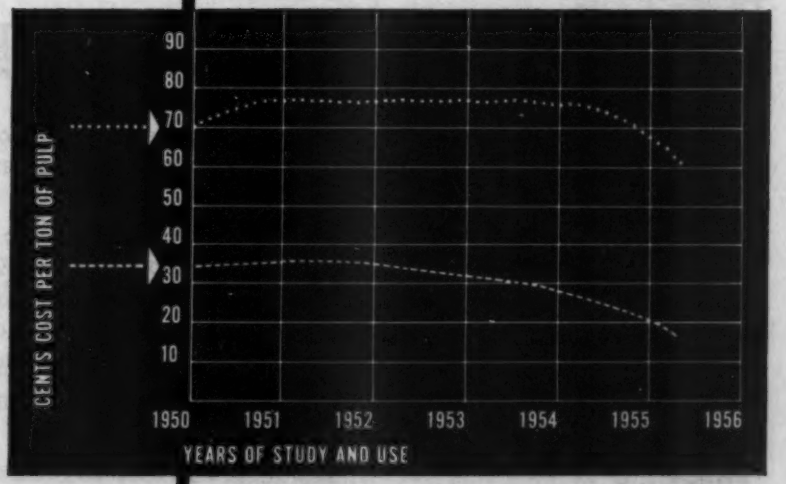
The smallest type of the proposed Eineder factory, designed to recover waste paper by his special method, would have a daily capacity of 20 metric tons.

Mr. Eineder estimates that about $75,000 would be necessary to build a waste paper recovery mill with an annual output of 6,000 metric tons of clean, immediately re-usable cellulose fibers, saving about 875,000 cu. ft. of wood. The price of his final cellulose pulp would be only 20 per cent above the waste paper purchasing price. Very small investments could double this annual production of 6,000 metric tons if a two-shift operation is desired or necessary.

Rhodia announces

a sharp price reduction in ALAMASK, with *improved odor abatement* for all operations of alkaline pulping, at new low costs per ton of pulp.

This means lower prices for the new ALAMASK P6D . . . lower cost per ton of pulp for control of malodors, whether you treat gases from digester operations, recovery, or condensers. Let the chart tell the story—



ALAMASK will do the job cheaper with better than average odor control. May our trained engineers help you with your malodor problems?

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PLANT: PATERSON, N. J.

Death *takes a holiday...*

let's make it a PERMANENT VACATION!

Vital living forests in place of stagnant acres...control of deadly forest fires and their terrible consequences: Death must take a permanent vacation from America's forest lands

Great progress has been made in protecting timber lands against fires since Weyerhaeuser initiated the Tree Farm movement in 1941 by establishing the Clemons Tree Farm. Weyerhaeuser rules call for vigorous protective measures not only against fires, but against forest insects and diseases as well.

At least 170 thousand forest fires nonetheless get started each year throughout the country; these avoidable fires lay horrible waste to about 15,000,000 forest acres annually.

Nine out of ten forest fires are preventable: they are man-caused and spring from public carelessness and ignorance. Thus, public education and Tree Farm organization will help prevent future forest fires.

Perpetual tree production plus the scientific control of fires assure woodpulp consumers of a constant supply from Weyerhaeuser.

WEYERHAEUSER

SAFETY NEWS

Built-in Life Preservers Protect Weyerhaeuser Loggers in Northwest

Boom men working the Everett, Wash. log pond of Weyerhaeuser Timber Co.'s lumber division are no happier about falling into the river than they ever were. But, floating is no longer one of their worries.

During wet, windy weather the men who jockey the big sticks wear bright yellow rain coats and pants with built-in life preservers. Inside each jacket are 28 air tubes and lining the pants are two king-size tubes. The combination makes it literally impossible for a man to sink, no matter how big his shoes or how heavy his clothing.

Weyerhaeuser purchases the regular rain jackets and pants and has a local firm make the life-saving lining to its specifications. "We have come up with what seems to be the best answer yet to the potential danger of working on the pond," says Keene Strobel, Everett division safety engineer.

Design of the new safety gear was the result of six months' trial on the pond by boom men. The inflatable air tubes are fastened to the inside of the rain clothing with snaps. Similar equipment is worn by boom men at the firm's branches in Springfield, Klamath Falls and Coos Bay, Ore., and at Enumclaw, Wash.

Tama Plant of Central Fibre Wins Safety Trophy

The Tama, Iowa plant of Central Fibre Products Co. has won its division's traveling safety trophy for the fourth consecutive year. The plant, which makes paperboard for book matches and egg cartons, had only one lost-time accident during 1954.

The presentation to the Tama mill was made by Robert Paramore, vice president of Central Fibre Products.

For its outstanding record the plant was also awarded an engraved plaque by its compensation insurance carrier, Employers Mutuals of Wausau (Wis.). Ira Kiser, Employers Mutuals accident prevention specialist from Davenport, made the presentation to L. L. Wallace, Tama plant manager. Mr. Kiser lauded the efforts of the safety committee, the members of which include L. B. White, plant superintendent; B. W. Hale, safety director; Erville Tode, assistant safety director; Loyd Strine, chief electrician; Art Klemak, master mechanic, and Ward Loftus.

Pulp & Paper above average as . . .

NSC Members Improve Safety Record

FOR THE FIRST time in its history, the Pulp & Paper Section of the National Safety Council in 1954 bettered the all-industry average accident frequency rate. Pulp and paper's rate has been reported at 7.21, while the industry average was 7.22.

Last year was the eighth consecutive year in which members of the NSC chalked up a record-breaking performance. Twenty-eight of the 40 basic industry classifications reduced their frequency rates, and half of them reduced their severity rates.

The average accident frequency rate for employees in all industries submitting company reports to the Council (based on the number of disabling injuries per 1,000,000 man-hours) was a reduction of 3 per cent from 1953. The 1954 rate is about half the 1946 figure of 14.16.

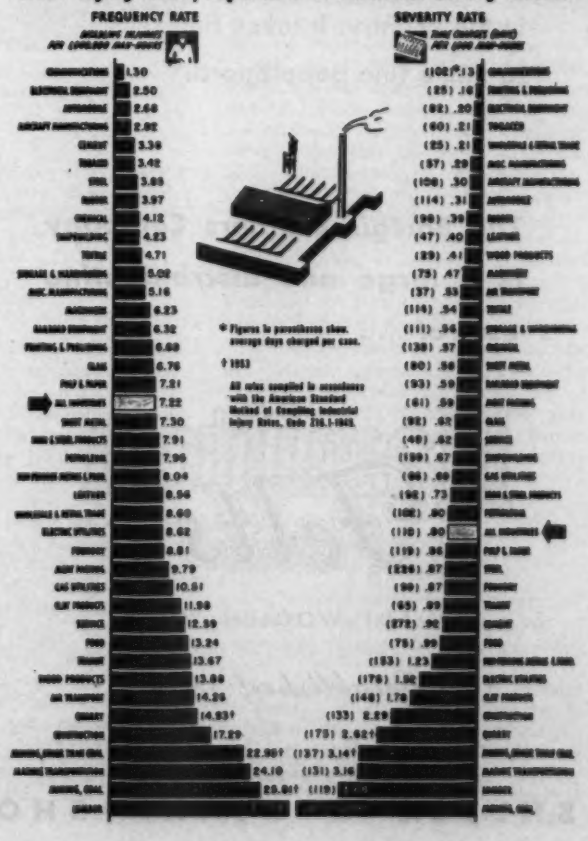
The communications industry again led all others by turning in the lowest frequency rate — 1.30. Electrical equipment ranked second with 2.50, followed by the automobile industry with 2.68. The relative position of these industries was the same in 1953.

Pulp and paper showed the greatest improvement for the year with a 24 per cent decrease in accidents.

The average accident severity rate for all industries reporting to the Council, based on the number of days lost per 1000 man-hours, was 0.80 last year — a decrease of 4 per cent from 1953. Pulp and paper's severity rate was 0.86, down 3 per cent.

The improvement registered over the years by the Pulp & Paper Section is shown by the following figures (industry average in parentheses); 1936, 17.59 (13.57); 1946, 22.27 (14.16); 1950, 11.80 (9.30); 1951, 10.90 (9.06); 1952, 10.06 (8.40); 1953, 9.54 (7.44), and 1954, 7.21 (7.22).

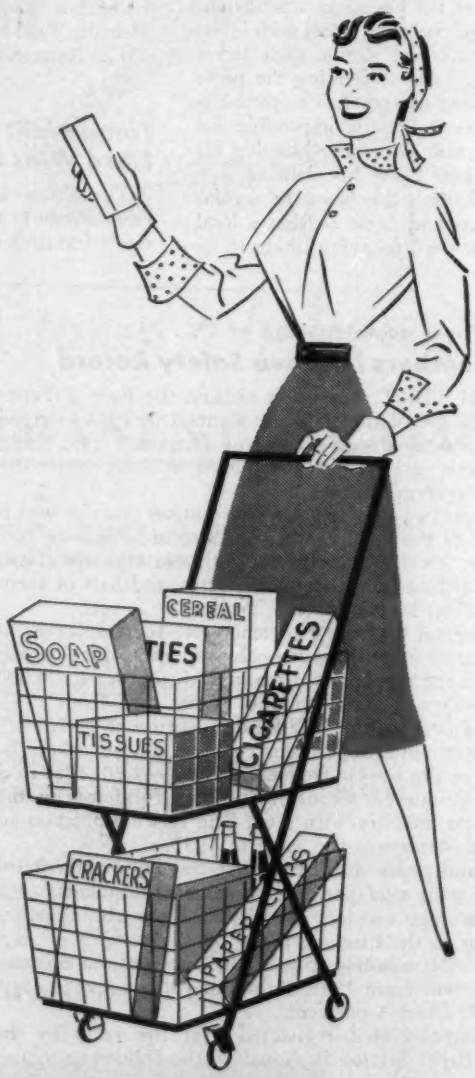
1954 injury rates, reporters to National Safety Council



HAM FELTZ says:

"The Bartgis Brothers Company wrote this advertisement for me:

'Our board must be of the highest quality to meet the requirements of some of the largest and most discriminating users of paperboard and folding cartons in the country. It takes fine felts to make fine paperboard.' "



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FOREIGN ABSTRACTS

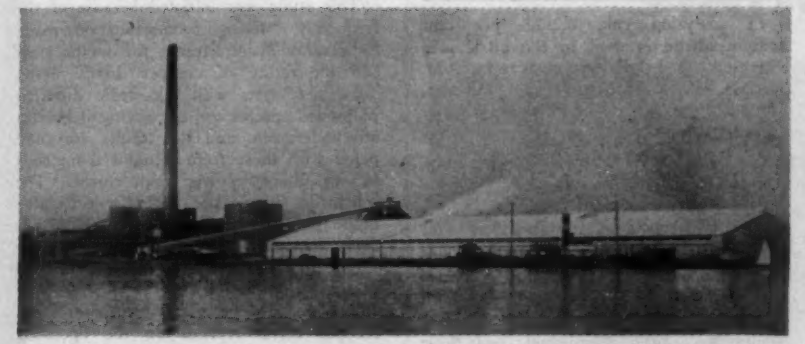

Fig. 1—The export harbor and pulp storage of Oulu Oy. The length of the quay is 323 meters and the length of the storage 200 meters

The Finnish pulp and paper industry

A brief report is given on the exports and production of mechanical and chemical pulps and on the expansion and increased production of various mills during 1954. The following plants and their new equipment are mentioned: Ab J. W. Oy (sulfite); Jakobstads Cellulosa Ab (sulfite); Kemi Oy (kraft); Oulu Oy (kraft) (Cf. Fig. 1), and W. Rosenlew & Co. Ab (sulfite). Finnish wallboard and paper production are also mentioned very briefly.

Paper mills that have recently added units or have been modernized include Kymin Oy; Tampereen Pellava-ja Rauta-Teollisuus Oy.

The new paper mill of Veitsiluoto Osakeyhtiö started production in 1955. Fig. 2 shows a paper roll in the longitudinal cutter of the mill.

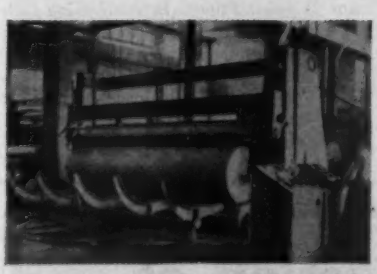

Fig. 2—A paper roll in the longitudinal cutter of the new paper mill of Veitsiluoto Osakeyhtio

The board industry and various power and steam plants receive short notices. Twenty excellent half-tones are included. Anon. *Finnish Paper and Timber*, No. 4, 1955, 54-58 (in English).

Pulps from mixed Surinam hardwoods

After making individual pulping studies of about 60 species of tropical hardwoods from Dutch Guiana, so as to exclude unsuitable raw materials, mixed hardwoods are subjected to a kraft pulping study. The initial experiments show that palm species and *Ceiba pentandra* wood should be excluded from such mixtures, since their presence is conducive to low yields and to high alkali consumption.

In the experiments with mixed hardwoods, two mixtures are used. These are based on the percentage of the individual hardwoods occurring in the Surinam forests. The first mixture is that of "dry land timber" based on forty-five species growing at the higher elevations. The second series consists of a mixture of fifteen "river bank and marsh species".

The first mixture is pulped by the standard kraft process; and, subsequently, modifications are made in liquor concentrations, liquor-to-wood ratios, sulfidity, and digestion periods. When optimum conditions are reached, the pulp yields are approximately 50 per cent (which includes 3.1 per cent screenings). A wrapping paper prepared from such pulps shows fair properties which are enhanced by introducing 25 per cent coniferous pulp into the furnish. Very similar results are reached by pulping the second mixture (of the river bank and marsh species).

The substitution of sulfur for sodium sulfide in the cooks proves unsatisfactory; the pulp is less well-digested, and the alkali consumption is higher. Nor is it found advisable to cook the chips in stages (as in the case of bamboo).

The Surinam woods make very good 9-point corrugated board, when a semi-chemical sulfate process is used which gives a yield of about 64 per cent. Neutral sulfite semichemical digestions can not be used. Impregnation is incomplete, and preliminary treatment with a concentrated sodium bicarbonate solution fails to improve the results, nor does improvement result by evacuation of the chips before soaking or the addition of a wetting agent.

The kraft pulps (obtained in 50 per cent) yield can be bleached by a multistage process involving gaseous or dissolved chlorine, a hot alkaline extraction, and two hypochlorite treatments. The following bleaching agents prove unsatisfactory: hypochlorite alone, chlorite, peroxides, and zinc hydrosulfite. Forty-one references are given. J. W. Ijff. *Koninkl. Inst. Tropen, Amsterdam, Afdel Trop. Producten*, No. 41, *Mededel* No. 110, 43pp. (1955) (original in Dutch with an English summary). through *Bull. Inst. Paper Chem.*, 25, 715-716 (1955).

Application of feed-back to fiber classifiers

Feed-back systems for the classification of fibers by screen fractionation are studied experimentally and theoretically, using a modified Bauer-McNett classifier.

Stiff model rayon fibers of uniform length are used in verifying the equations derived for the time-dependence of fiber concentrations. A correlation is established between the fiber length of a uniform sample and the weights of fractions collected after a given time interval in the classifier compartments. Assuming a Gaussian distribution of fiber lengths in a non-uniform sample, a correlation is obtained between the weights of the fractions collected and the weight average fiber length, with the standard deviation as parameter.

The results obtained by experiment are in satisfactory agreement with above correlations for the model rayon fibers and for groundwood and bleached sulfite pulp fibers. Olle Andersson and William Bartok. *Svensk Papperstidn.*, 58, 367-373 (1955) (in English).

Bleaching sulfite pulps with sodium peroxide

The author stresses the advantages and mentions a few of the shortcomings of single-stage peroxide bleaching of sulfite pulps.

The various techniques used in applying the peroxide (e.g., in the kollergang, in the refiners, etc.) are described. In general, such operations require 3.5 to 4 per cent of sodium peroxide based on the dry weight of the pulp. Small amounts of hemicelluloses are lost due to the alka-

linity of the bleach, and subsequent beating time of the stock may be very slightly increased. Certain strength properties of the pulp are also slightly affected, but, in the author's opinion, these are relatively insignificant; and in some instances at least the tear-resistance of the pulp is slightly increased.

The following are advantages claimed for single-stage peroxide treatment. The end brightness of the pulp is about 77-82 per cent. The peroxide exercises a certain cleansing action. Pulp losses are only 1-2 per cent, since the peroxide does not entail delignification. Pulp fibers are not attacked as in the case of chlorination. There are no significant installation costs such as those demanded in conventional bleacheries. There is no steam or power consumption, no washing or thickening after bleaching, and no significant fiber losses. Furthermore, odor problems and health problems are eliminated.

Costs are discussed briefly. Helmut Schröter. *Wochbl. Papierfabr.*, 83, No. 10, 383-6 (1955) (in German).

New method for the determination of cellulose in wood

Wood shavings are treated with 3-4 per cent nitric acid containing a few drops of a concentrated solution of sodium nitrate. The suspension is boiled 1 hour, filtered, washed with hot water and then boiled 1 to 1.5 hours with 3 per cent caustic soda, filtered, washed, dried and weighed. The following table gives the percentage cellulose, and the percentage alpha cellulose and residual lignin in the cellulose (I).

Wood	% Cellulose (I)	% Alpha Cellulose in I	% Lignin in I
Pine	49.5	86.0	1.2
Spruce	50.5	85.0	1.0
Birch	42.3	87.0	0.8
Alder	38.5	94.7	0.7
Aspen	44.2	93.0	0.9

In analyzing oak, 0.2-0.3 per cent sodium nitrite is used in the nitric acid digestion. O. N. Krasovskaya and V. M. Nikitin. *Bumazh. Prom* (Paper Industry, U.S.S.R.), 30, No. 1, 14-15 (1955) (original in Russian); through C. A. 49, 7849 (1955).

Estimation of cellulose when blended with asbestos

In the asbestos industry, so as to improve carding and spinning, cotton and viscous fibers are frequently blended with asbestos. In the United States, various grades have been established, and these are based on the percentage of asbestos in the various blends. No such grading obtains in Great Britain. In establishing such grades, a simple method for determining cellulose is required.

An analytical method that permits removal of cellulose involves ignition at 370° C; this causes only a relatively slight loss (and a constant one) of Chrysotile asbestos. This has been found preferable to the usual method of ignition at 800-810° C. A description of the method is given, and its application to glass fibers blended with viscose is discussed. C. Z. Carroll-Porczynski. *J. Textile Inst.*, 46, No. 2, T65-70 (1955).

Electric motors for chipper drives

This study was initiated because of the frequently differing recommendations made by various manufacturers for motor sizes and the rating of chipper drives. Systematic field tests with logs from different pulpwood species and of varying diameters are undertaken, and the results are compared with those from recognized methods for calculating power requirements. The conclusion is reached that the calculated figure of 302 horsepower seconds per cubic foot of wood serves as an average value for Western hemlock and is supported by actual tests.

The selection of a suitable motor for a chipper drive depends on the operating methods, the power system, and the plant capacity. The latter and time of chipper operation require prime consideration, and the size of chips and average and minimal size of wood fed to the chipper should also be known. This information may then permit the selection of the chipper.

The motor rating and type should be selected so as to give the needed production in the required operating time. However, the possible effects of motor installation on the power system must also be explored. Although the synchronous motor is the most efficient for large chippers, this cannot always be used because the power system may be too small to carry peak loads. The wound-rotor motor has an advantage in large chipper drives when the power system is limited in this way. Most suitable for small chipper drives is the standard squirrel-cage induction motor, which proves more economical than does the synchronous or wound-rotor motors in these small ratings. E. A. Creelman. *Canadian Pulp and Paper Ind.*, 8, No. 4., 8-10, 12, 14, 16, 18, 23, (April 1955); through *Bull. Inst. Paper Chem.*, 25, 721 (1955).

Magnesium sulfite for pulping straw and hardwoods

This study is undertaken to determine whether magnesium monosulfite can be used in place of sodium sulfite in pulping hardwoods and straw. In any cooks that also normally require the use of caustic soda, sodium carbonate, or sodium bicarbonate, these are replaced by magnesia. Evidently, the digestions are reasonably successful in the case of rye straw, esparto, poplar and birch, and semichemical pulps obtained in this way have properties very similar to those of pulps made from sodium sulfite. When magnesia is added (in place of the usual sodium compounds) and the pulping is carried out with magnesium monosulfite, the results are also satisfactory, but the amounts of chemical used are somewhat greater than corre-

Greater Production of Higher Quality Pulp

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sponding amounts of sodium sulfite and sodium hydroxide; and the bleaching operation requires 50 per cent more chlorine than does the sodium sulfite pulp.

To insure economy of spent liquor evaporation, the solids content must be increased by re-using the liquors and adding fresh chemicals. In principle at least such re-use is feasible. Orienting laboratory experiments on the recovery of cooking chemicals make it appear that 85-90 per cent of the magnesium and sulfur can be recovered respectively as magnesia and sulfur dioxide. Losses in magnesium sulfite ($MgSO_3$) can be made up by adding magnesium sulfate ($MgSO_4$) to the spent liquor prior to combustion. Ninety-eight references are given. P. M. Smolders. Treatise No. 3, Netherlands Experiment Station for Straw Utilization, 1954, 90 pp.; through *Bull. Inst. Paper Chem.*, 25, 750 (1955) (original in English).

Papers from castor stems

Pilot plant experiments in India (at Dehra Dun) on the production of writing and printing papers from castor stems (*Ricinus communis*, Linn.) pulped by the kraft process are described. Bleached pulps in yields of 40.9 to 43.6 per cent are prepared, but these are short fibered. However, both writing and printing papers with satisfactory formation and strength properties are obtained when the castor stem pump is mixed with about 30 per cent of longer fibered pulp (e.g., from bamboo). R. V. Bhat and Narendra S. Jaspal. *Indian Pulp and Paper*, 9, No. 7, 351-4 (1955) (in English).

Wet combustion of spent liquors

The possibilities of wet combustion are fully discussed, and viewpoints are given regarding the various types of installation that can be used for spent liquors and the types of equipment that can be introduced into wet-combustion plants.

The paper also serves to give data on steam generation, power production, chemical recovery and the construction costs. Wet combustion refers to the release of heat from organic matter that is dissolved or suspended in water and refers especially to the work of Cederquist (cm. abstract in THE PAPER INDUSTRY, May 1955, p. 187). Such combustions appear promising for semichemical spent liquors; and, in the case of the sulfite and kraft processes, wet combustion appears to have marked advantages with regard to heat economy, but its limitations are equally obvious when it comes to power generation.

Construction costs are not out of line from those used at present in evaporating and burning spent liquors in sulfite and kraft mills. Bengt Brunes, Torsten Järnberg, and Sven-Erik Jönsson. *Svensk Papperstidn.*, 58, 332-343 (1955) (original in Swedish, with brief English and German summaries).

What, actually, do Vacuum Pumps on paper machines handle?

Paper mill engineers know that it is actually a mixture of air and water vapor, but the custom of rating vacuum pumps in terms of air capacity alone causes this important fact to be frequently overlooked.

The presence of this water vapor causes a considerable reduction of the effective air handling capacity of any vacuum pump except the Nash. In the Nash Vacuum Pump the bulk of this water vapor is effectively condensed, due to the Nash operating principle. The air handling capacity of the Nash is therefore not reduced.

That is one of the reasons why Nash Vacuum Pumps are standard in over a thousand leading Paper Mills.

NASH ENGINEERING COMPANY

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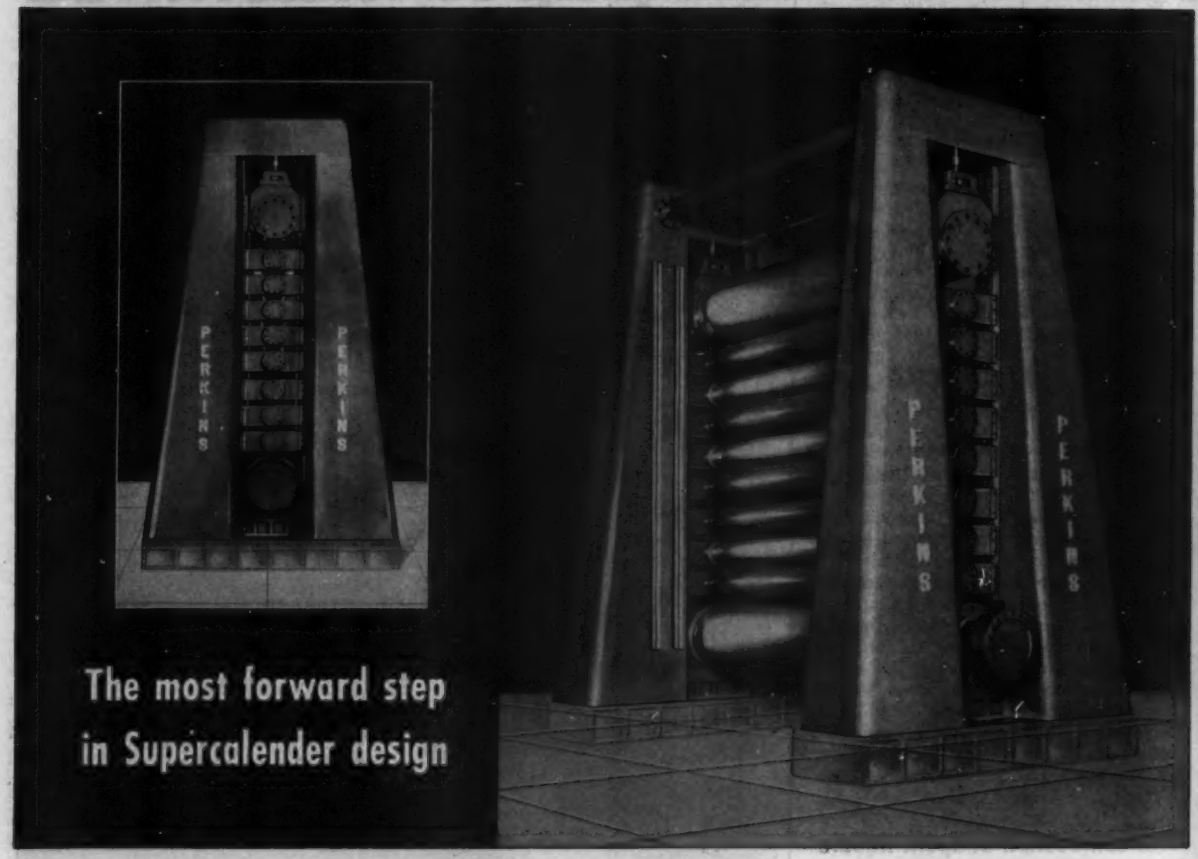
PERKINS ANNOUNCES— NEW SUPERCALENDER DESIGN



The most forward step in Supercalender design

The most modern and rugged design Supercalender ever built for super finishing—"Steady as a Rock"—frames and base of heavy fabricated steel plate sections, reinforced throughout—making possible speeds and pressures beyond present-day practices. Equipped with heavy Timken tapered roller bearings or SKF spherical self-aligning roller bearings. This new Perkins design is the most forward step in the design of Supercalenders in years.

All hydraulic pipe lines, oil lubrication lines and air lines will be concealed inside the calender frames, with easy access for installation of the pipe lines. The Calender will have double tee slots on each frame upright for rigid support of fly rolls, platforms or other members to be attached to the inside of the calender frames. Each Supercalender to have a roll removal unit for ease in removing the rolls endwise through the calender frame gaps.

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NEW PRODUCTS

Digester strainers

The design of the stainless steel ESCO digester strainers has recently been improved. One of the features of the new unit, known as the lap joint strainer, is the saving in installation time. According to the manufacturer, a typical installation in one pulp mill required only two hours. This greatly reduced installation time is brought about by the lap joint feature, which eliminates special fitting in the field. The gap problem is overcome.

Pulp mills now need order and stock only one size strainer even though they may have more than one size digester. According to the manufacturer, the lap joint frames slip easily into place and adjust with a sort of "telescopic action" to form a complete circle inside the digester. These strainers have heavier frames than the old style and also have a further refinement of flush-mounted screen plates. They are designed for longer wear and less maintenance, it is claimed.

The new units can be installed in a steel (or stainless-lined) digester by welding in small support lugs at the corner of each strainer, or they can be installed in a brick-lined digester with shoulder bolts and Z-bar support ring segments, which give continuous support around the top and bottom of the strainer ring. Either type of support permits quick and easy removal of individual strainer frames for inspection and cleaning. *Electric Steel Foundry Co., 2141 N. W. 25th Ave., Portland 10, Ore.*

Deaerating heater for small plants

The availability of a small new deaerating heater has been announced. This heater is designed specifically for use in small plants where economy and space requirements are of primary importance.

While heating the feedwater to the temperature of the operating steam, the SSC deaerating heater removes non-condensable gases such as oxygen and carbon dioxide in the feedwater, thus reducing corrosion. Since steam is used in the deaeration process, plants can utilize exhaust steam or reduced pressure make-up steam for this purpose. Recovery of waste steam for use in the heater prevents loss of thermal energy and reults in fuel savings, according to the manufacturer.

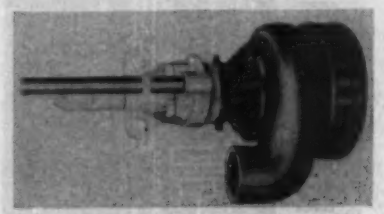
This deaerating heater is a two-stage, spray-type heater containing an internal vent condenser of stainless steel. According to the manufacturer, it is easily installed, requires a minimum of maintenance, and comes completely equipped with all accessories in a wide variety of sizes. Minimum heater elevation is obtainable by combining the heater with a low NPSH boiler feedwater pump. This small unit is also available as part of a packaged feedwater treatment system, including a low NPSH boiler feedwater pump and automatic zeolite softener. *Graver Water Conditioning Co., 216 W. 14th St., New York, N. Y.*

Air compressor

A 125 hp electric-driven air compressor has been added to the Ingersoll-Rand line of air-cooled two-stage Type 40 stationary compressors. The new size is expected to fulfill the need for a lightweight compressor of this size that can easily be moved from job to job.

Some of the new features of this unit are: single-core, horizontal-flow intercooler, new shrouding, force-feed lubrication, full free-air unloading and a new version of the Channel valve. It can be installed with a minimum of foundation, time and labor, according to the manufacturer.

Either constant-speed control or dual control can be furnished. Dual control is available with either automatic or manual selection, permitting operation at constant-speed or automaitc start-and-stop, whichever is more economical. *Ingersoll-Rand Co., 11 Broadway, New York 4, N. Y.*



Pneumatic Sponge pump

A new heavy-duty Pneumatic Sponge pump which is rugged yet compact and lightweight has been introduced. It is ready for operation simply by connecting it to a 105 or 125 cfm air compressor. No priming is needed. All that is necessary is to connect the air hose and water discharge hose. An exhaust pipe prevents muck and water from entering the motor and the length of this exhaust can be extended as required. This self-contained, air-powered sump pump is easily handled or carried from place to place, according to the manufacturer.

The BJ 2½"L Pneumatic Sponge pump is a vertical, single-stage, centrifugal pump driven by a rotary air motor built to operate on compressed air at pressures ranging from 60 to 100 psi and air consumption from 57 to 99 cfm. This

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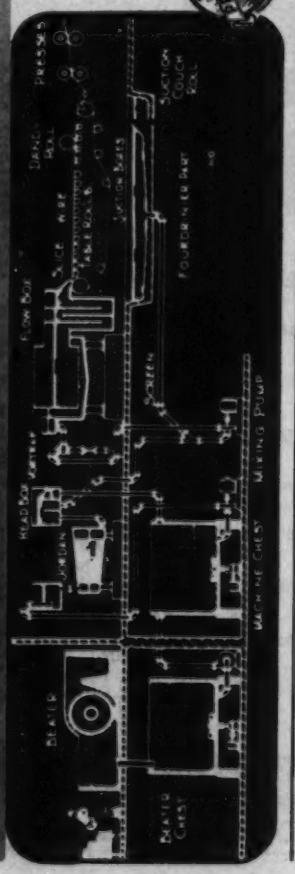


New Products . . . . . .

high-lift sump pump was developed to operate against heads of 7 to 76 cu. ft. and capacities up to 380 gpm.

The rotary air motor is equipped with a governor and has a variable speed control, permitting regulation to suit particular conditions of the job. An oiler is attached with ample capacity for 10 hours operation. This oiler may be detached and used anywhere in the air supply line.

The impeller is a two-port, non-clogging type of heat-treated Meehanite mounted on a stainless steel shaft, supported by heavy-sealed, grease-lubricated duplex thrust and radial ball bearings. An adjustable bronze wear ring is inserted in the case and can be quickly adjusted to compensate for wear.

The volute case, including suction and shaft covers, is of Meehanite. The connector between air motor and pump is also of Meehanite. Double seals keep water, dirt and grit from bearings and motors. A Meehanite strainer attached to the pump case serves as a screen to exclude gravel or debris that cannot pass through the pump. *Byron Jackson Co., Pump Div., P. O. Box 2017, Terminal Annex, Los Angeles 54, Calif.*

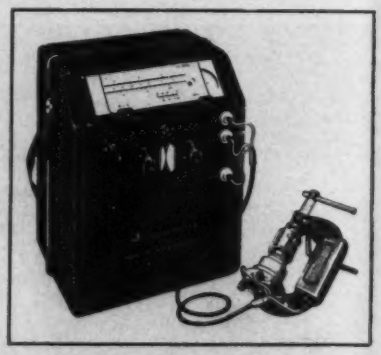
Polyethylene wax

A new polyethylene wax, designated as Epolene, was recently introduced to the market. This new wax is available in small pellet form about the size of a grain of rice and will be packaged in standard easy-to-handle 50-lb. paper bags.

The wax is available in two forms: an emulsifiable type known as Epolene-E and a non-emulsifiable type known as Epolene-N. The latter is finding application in melt coatings of the kind used on bread wraps, milk cartons, etc. Following are some of the benefits of incorporating Epolene into mixtures of basic paraffin for melt coating applications: increases block resistance; increases resistance to moisture-vapor transmission; increases hardness; has a higher melting point; increases flexibility, and improves dielectric properties.

According to the manufacturer, the new wax appears to be superior in many respects to other synthetic waxes on the market, to micro-crystalline waxes, and to many expensive natural waxes. The outstanding property claimed for the new product is its demonstrated ability to plasticize other waxes.

According to the manufacturer, both forms of Epolene are priced competitively with waxes of comparable properties. *Eastman Chemical Products, Inc., Kingsport, Tenn.*



Electronic Moisture Meter

Designed with special regard to the needs of the paper industry, the electronic moisture meter will measure percentage moisture content of chemical wood pulp and boards from 6 to 22 per cent and paper over the range 3 to 13.1 per cent, according to the manufacturer. Extra calibrations enable it to be used with vulcanized fiber, kraft, kyro, sulfite, esparto, straw, etc.

No preliminary weighing is required, while errors resulting from bulk or thickness are reduced to negligible proportions, according to the manufacturer, who also claims that an accurate result can be obtained in less than one minute. Unskilled operators can be quickly instructed in the use of the equipment, which is intended for the production line, as well as the laboratory.

An accuracy within 0.5 per cent is claimed using existing calibrations. Where a specific product is to be measured frequently, a calibration can be produced by correlating instrument readings with the results of oven checks normally used at present. It is claimed that such a calibration achieves an accuracy as high as 0.2 per cent, and thereafter the lengthy oven method need rarely be used.

The unit is fully portable and may be obtained with ac line convertor or long-life batteries. *Marconi Instruments Ltd., 44 New St., New York 4, N. Y.*

Combination hot process hot zeolite water conditioner

Pure water for boiler feed and process use is achieved at low cost through the use of the hot process hot zeolite water conditioner, combining a hot process softener with a hot zeolite softener.

According to the manufacturer, the hot process-hot zeolite combination requires a lower capital investment than a comparable two-stage hot lime soda hot phosphate sof-

tener. It is also claimed that chemical costs are lower since the zeolite softener uses salt for regeneration, instead of more expensive soda ash, and substantially reduces supplementary phosphates. The simplified softening operation compensates for variation of hardness in the influent water.

This combination water conditioner is said to more effectively lower the silica content of the treated water, in addition to reducing alkalinity of the effluent to approximately half the value attained by hot process softeners, with a consequent reduction of carbon dioxide in the steam. *Cochrane Corp., Philadelphia* 32, *Pa.*

Steam trap for light loads

The "20-A" ½ in. impulse steam trap, specially designed with low capacity to handle light condensate loads, was recently introduced to the market.

According to the manufacturer, this trap will not freeze or air bind on steam tracer line service, and it also gives top performance on other light load applications, such as small platens, autoclaves, hospital sterilizers, unit heaters, etc.

The design and operation of this trap is similar to the standard Yarway impulse trap. Small size, low cost, body and all working parts of stainless steel, good for all pressures to 400 psi are other features of this trap. *Yarnall-Waring Co.,* 147 *Mermaid Ave., Philadelphia* 18, *Pa.*

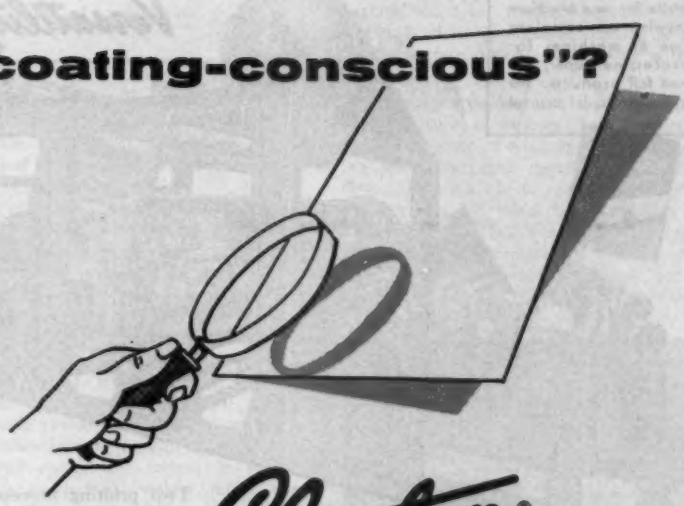
Industrial lift truck with panoramic visibility

A new concept in lift truck engineering is the one mast design of the Monomast. According to the manufacturer, this new lift truck has panoramic visibility never before possible with conventional upright assemblies. The unique Monomast engineering consists of two box-type sections, one telescoping within the other.

The new unit is said to offer many advantages. It allows the operator a clear, unobstructed view to both forks and load, permitting faster operating speed and reducing driver fatigue. Faster maneuverability, faster approach, more accurate load placing and safer load handling are also reported.

The total weight of the lift truck is about the same as standard-type assemblies, but its tubular design is said to be

"coating-conscious"?



use Clinton® starches

For over 30 years, Clinton starches and dextrins have helped satisfy "coating-conscious" papermakers.

Clinton is just as interested in coatings as you are. Why? Because a coating — *any coating* — is no better than the adhesive that holds it together and binds it to the paper. Clinton starches and dextrins do an admirable job in both respects.

And if it's "size-satisfaction" you're looking for, Clinton starches are sure to measure up to your most hopeful expectations.

. . . *and remember* : technical service in connection with your specific problems is available upon request

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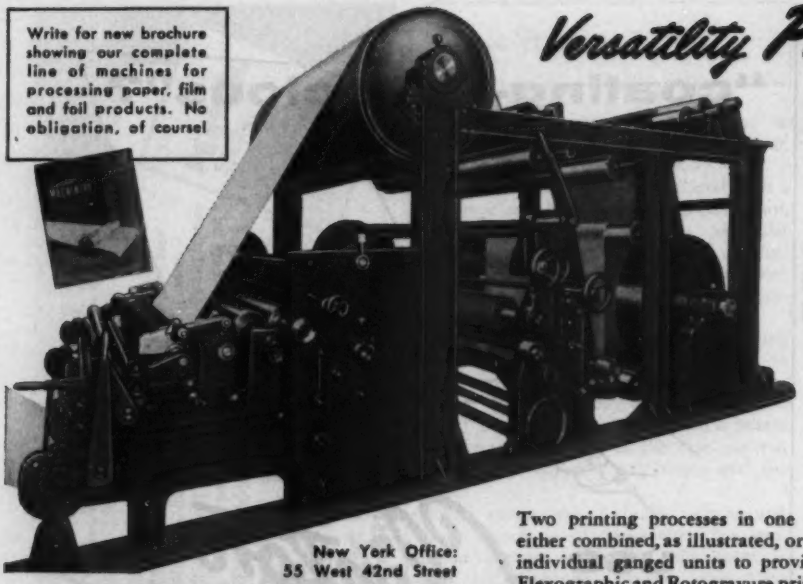
Write for new brochure showing our complete line of machines for processing paper, film and foil products. No obligation, of course!



Versatility PLUS with the H.S.

PRINTER-TINTER

One unit machine prints heavy papers and boards in 4 different processes!

1—*Flexographic printing or tinting only*
2—*Flexographic tinting and overprinting in rotogravure*
3—*Roto printing or tinting only*
4—*Roto tinting or design printing and overprinting with Flexographic.*

Two printing processes in one — either combined, as illustrated, or in individual ganged units to provide Flexographic and Rotogravure printing in dual operations. Used in combination, these two print processes give you an exceptional wide range of decorating possibilities. Instant drying between processes is accomplished with 48" diameter steam drying rolls — one for each of two operations. Machine is built to any size web from 50" to 90" and processes sheet up to unit capacity. Double drum rewinders with slitters may be furnished, if desired. Machine is driven by horizontal shaft equipped with bevel gears and clutch throw-outs for each unit. Simplified construction permits addition of more colors in either Flexographic or Roto. Write for complete details — Model No. 3-RA.

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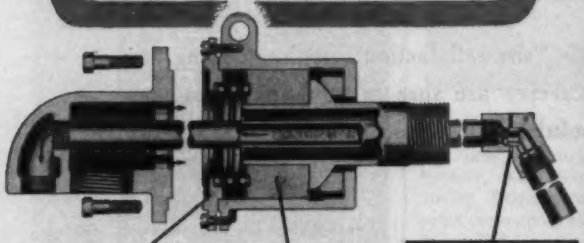
MACHINE CO • GREEN BAY • WIS
Manufacturers of
Printers, Embossers, Folders, Interfolders, Waxers, Laminators, Wrapping Machines, Core Winders, Packaging Presses, Crepers and Napkins, Toilet Tissue and Paper Towel Units.

Johnson Joint

SELF-SUPPORTED TYPE with SYPHON ELBOW



ASSEMBLY PLATE — Holds internal parts in position when head is removed.

SELF-SUPPORTING — Needs no external supports of any kind.

SYPHON ELBOW — Permits use of straight pipe for syphon. Can be inserted or withdrawn right through the joint.

WRITE FOR INFORMATION

Bulletin S-2001 has all the facts on this joint-and-elbow combination that supports itself, has no packing, needs no lubrication, outmodes unwieldy syphon pipes. Johnson Joints are also available in pipe-supported and rod-supported types, to suit all operating needs.

The Johnson Corporation
845 Wood St., Three Rivers, Mich.

POOLE

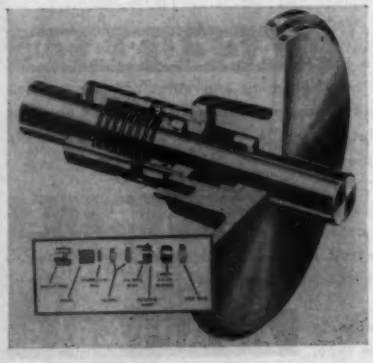
A COPY OF CATALOG GIVING FULL DESCRIPTION AND ENGINEERING DATA SENT UPON REQUEST.

FLEXIBLE COUPLINGS

POOLE FOUNDRY & MACHINE COMPANY — WOODBERRY, BALTIMORE, MD.

even stronger than comparable models. Torsional rigidity in the mast has been increased 80 per cent and mast deflection reduced 50 per cent over conventional upright or mast assemblies, it is claimed.

All standard hydraulic attachments can be mounted on the attachment carriage; non-hydraulic attachments are also available. The Monomast mounting is conventional and can be field-installed on current 3,000- and 4,000-lb. Models UC-30 and YC-40 without alteration. *Hyster Co., 2902 N. E. Clackamas, Portland 8, Ore.*



External mechanical seals

A new line of Chempro "wedge-lock" external mechanical seals which can be installed in only 30 min. is now available. These seals, it is claimed, are the first mechanical seals to be designed for complete interchangeability with stuffing-box packing in pumps, agitators, autocalves and other rotating processing equipment. According to the manufacturer, the seals do not require special holding clamps and machining of stuffing-box faces to assure alignment.

It is reported that perfect sealing is assured, with the possibility of spray leakage eliminated, since the sealing faces are located inside the stuffing box. The hazards in handling corrosive, toxic, explosive and flammable liquids are said to be reduced. The seal eliminates shaft scoring and operates with a minimum friction load on the shaft.

The seal consists of only eight parts, involving no complicated pieces. Installation and servicing the seal can be handled in the field by maintenance crews. *Chemical & Power Products, Inc., 11 Broadway, New York 4, N. Y.*

Hollow-shaft vertical motors

A new line of hollow-shaft vertical motors has been introduced to the market. Available now in ratings of 40 hp and up, in frame sizes 404 through 6330, and in ratings from 7½ hp and up early in 1956, the new line of motors represents a complete redesigning of all major parts.

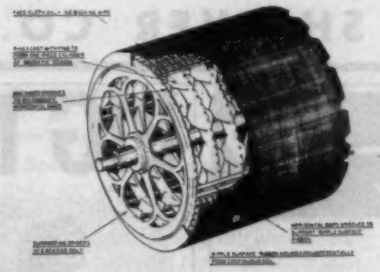
According to G-E engineers, installation, inspection, and maintenance has been made easier by using a lightweight cap (made of aluminum in the larger sizes) which can be lifted by one man. When the cap is removed, couplings and bearings are available for inspection, and all installation

New Products . . . . . .

attachments and impeller adjustments can be made without further disassembly. The motors are so designed that couplings can be changed in a few minutes with ordinary tools, it is claimed.

Lubrication is simplified by a new Vistamatic lubrication center, providing an oil gage which can be read easily and ample filler and drain plugs to facilitate adding and draining lubricant quickly with little likelihood of danger to the motors, according to G-E engineers. A large capacity oil reservoir helps prolong lubricant life, and a machined metering hole supplies lubricant to the bearings at all times. During idle periods, the bearings are completely submerged to inhibit rusting.

To help protect the motors in higher ratings from electrical system shorts and burnouts, the motor windings are insulated with Polyex, a new insulation which combines new synthetic materials. The windings in the smaller sizes employ Formex. Additional protection from weather and physical damage is provided by a cast-iron frame. The new frames meet NEMA standards for weather-protected motors. *General Electric Co., Schenectady 5, N. Y.*



Cylinder mold

One of the latest developments in cylinder mold design and construction is now being offered. Originated by Knowles-Trotman Ltd. of London, this mold, designated as the Ripple Surface cylinder mold, has been further developed by Black-Clawson engineers and will soon be available in a range of diameters for application to board machines in this country.

Completely eliminating the need for intermediate spiders, the construction of the mold employs a geodetic principle similar to that used in airplane wing structure. The mold employs only the two end spiders with a series of rings forming the structure of the mold between the end spiders. These rings are spaced by angular wings which are cast and welded together to provide an extremely rigid cylinder. The entire weight of the cylinder, plus couch loading, is transferred to the shaft and bearing supports at the ends of the mold with a bare minimum of deflection across the face of the mold. Special shaped longitudinal bars are set into machined grooves in the rings. These bars, in turn, support a Ripple Surface ribbon which takes the place of the winding wire and backing wire on the conventional mold. The face cloth is installed directly to the Ripple Surface ribbons. No backing wire is required.

Advantages claimed for this new cylinder mold are as follows: better drainage through absence of winding wire and backing wire; increased speed of formation; better formation due to reduction of turbulence within the mold by elimination of spiders; use of finer mesh face cloth permitted; longer face cloth and felt life, and increased couch pressure without deflection. *Black-Clawson Co., Hamilton, Ohio.*

Slitting and roll winding machine

The new Model "400" slitting and roll winding machine, designed for use in converting plants and finishing rooms, is capable of running at 1000 fpm and has a rewind capacity of 30 in. diameter.

Designed to provide flexibility of production, this machine handles a wide variety of materials, including paper. It has provisions for changing from one slitting method to another, using either pneumatic or spring lever score-cut, shear-cut or razor-cut.

When the pneumatic score-cut slitting method is used, the "400" is equipped with a new type element. This element incorporates for the first time a straddle mounted wheel. The wheel runs on two bearings, which, according to the manufacturer, assures rigid alignment, friction free running, and accuracy in strip width.

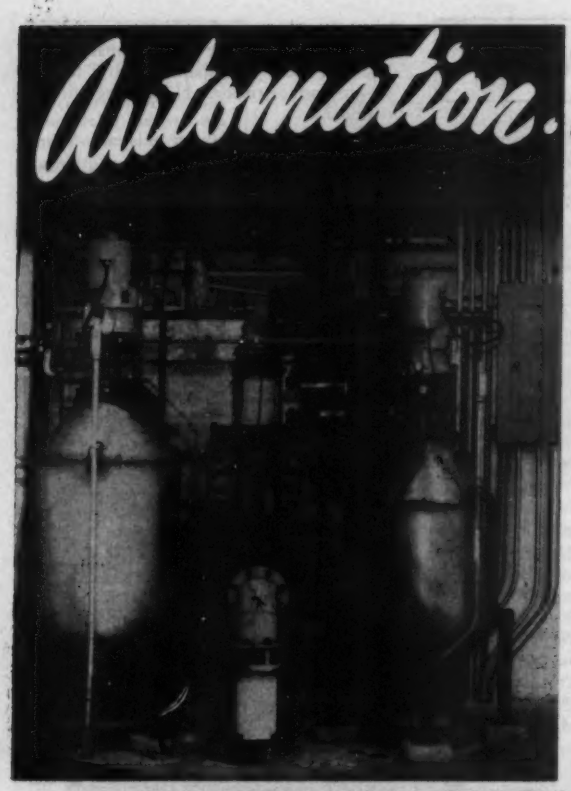
This model can also be equipped for high production of rolls having a diameter of less than 30 in. When using small diameter cores, the winder can be equipped with an auxiliary midget riding roll, said to provide tight wrap at the start. *Cameron Machine Co., 61 Poplar St., Brooklyn 1, N. Y.*

Mechanical seal

A mechanical seal, specifically designed for use on rotary shafts at pressures up to 150 psi, has been announced. Known as the BB-21A Mechanipak seal, it is furnished completely assembled and ready to install. Standard construction includes brass shell, brass washer, and Buna-N bellows. Seals are available for shafts from ⅜ to 3 in. diameters.

Buna-N or neoprene bellows are furnished for operating temperatures up to 212° F and pressures up to 150 psi. Sili-

Automation...on stock supply!



DeZURIK AUTOMATIC RECORDING CONSISTENCY REGULATORS

ACCURATE

DeZurik Automatic Stock Consistency Regulators deliver a complete 24-hour recording of both incoming and outgoing consistencies. They are guaranteed to hold consistency within limits of plus or minus .1%. (Many DeZurik Regulators directly ahead of paper machines are holding consistency within plus or minus .02%!)

SIMPLE

Adjustment is easy — a single knob sets the regulated consistency. Operation is unaffected by spattering stock, and response is instantaneous to changes in incoming consistency.

ADAPTABLE

A wide range of box designs in three basic types: Pipe Line type, used on systems under pressure; Pan type takes gravity flow from washers, deckers, save-alls, etc.; Stuff Box type installation ahead of paper or board machines, or ahead of a finishing refiner. WRITE FOR COMPLETE DETAILS.

DeZURIK SHOWER CO. SARTELL, MINNESOTA

Burtonite® #7

It's **chemical hydration** by the pound.

Briefly, benefits following partial replacement of **mechanical** refining with this amazing gum include:

Opportunity for employing **higher percentages of short fibred pulps . . . reduced cost of power** for refining . . . **uniform formations** . . . faster drainage . . . surprisingly excellent freeness on presses and dryers . . . **faster machine speeds . . . less decided "grain" . . . lower densometer readings . . . greater bulk, compressibility, opacity, and porosity . . . better tensile, fold, tear . . . less hygroexpansivity, curl, wrinkle, or warp . . . less two-sidedness.**

0.5% on **dry** fibre weight effective (add it to water under agitation in **pulper** or **beater** prior fibre.)

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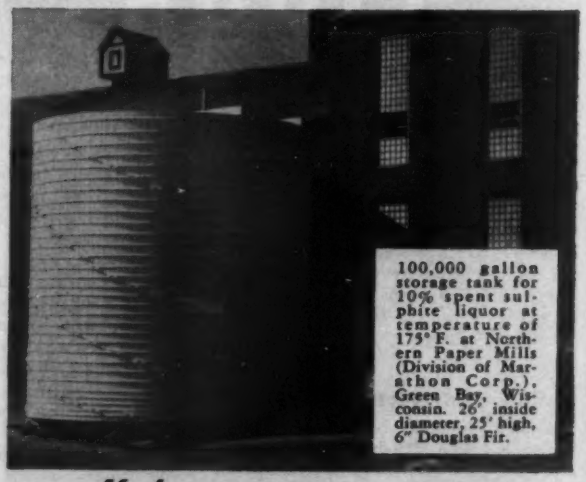

100,000 gallon storage tank for 10% spent sulphite liquor at temperature of 175° F. at Northern Paper Mills (Division of Marathon Corp.), Green Bay, Wisconsin. 26' inside diameter, 25' high, 6" Douglas Fir.

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. . . quality-built to your specifications

Engineering experience, craftsmanship, selected top-grade tank lumber . . . your guarantee of satisfaction. For large tanks or small, see *Kalamazoo* first. Free estimates and suggestions.

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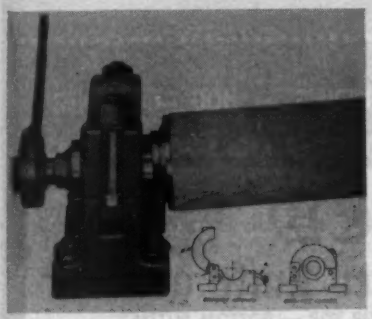
New Products . . . . . .

cone bellows are provided for temperatures up to 400° F, where pressures do not exceed 50 psi.

The BB-21A seals are designed for use on rotary shafts of various types of equipment, such as centrifugal pumps, gear boxes, speed reducers, and agitators. According to the company, these mechanical seals eliminate wear on shafts and shaft sleeves, eliminate fluid leakage, reduce downtime, and cut maintenance costs. *Garlock Packing Co., Palmyra, N. Y.*



Split-type brackets for expanders and felt preservers

Two new split-type brackets for use with free wheeling expanders and felt preserver units have been introduced to the market.

The inset drawing shows the design of the bracket used with 6¼ in. diameter expanders. A hinged eye bolt (A) flips to the side when loosened, allowing the top of the bracket assembly (B) to open upward on its hinge (C). According to the manufacturer, this simplified design makes it easy to remove expanders for service and also facilitates the changing of felts on papermaking machines using inside rolls. The photograph shows the cap-type split bracket used with 7 in. diameter expanders. In this model, when two screws are loosened, the entire upper portion of the bracket may be lifted off.

The expander and bracket assembly for both types also includes a built-in ratchet wrench for easy adjustment of expander bow position. A cut-out saddle provides a convenient spot for attaching slings when a winch is used to lift out rolls.

The brackets are furnished as optional equipment on all new expanders and felt preservers and are also available as a modification for units now in use. *Mt. Hope Machinery Co., Taunton, Mass.*

Dead weight pressure gauge testers

New improved models of the dead weight pressure testers have been announced. These testers are said to be sturdy in construction and modern and compact in design. Operation is simple, thus no skilled labor is required. According to the manufacturer, the tester is guaranteed to be accurate within 1/10 of 1 per cent of the indicated reading.

Three models are available: up to 3,000 psi; from 4,000 to 6,000 psi, and up to 10,000 psi. The complete unit with accessories is portable and contained in a metal case. Literature is available upon request. *Amthor Testing Instrument Co., 45-53 Van Sinderent Ave., Brooklyn, N. Y.*

New Ideas

(Continued from page 438)

Foam and air entrainment

(John Gunning, Provincial Paper Co.)

▶ Provincial Paper Co. is using the Deculator (manufactured by Rotareaed) for effective deaeration of coating color. The operation consists in spraying the coating color at high velocity against a receiver. The Deculator is evacuated by means of a steam ejector and vacuum pump.

The high shear to which the coating is subjected upon impact on the receiver has no adverse effect on the individual constituents of the coating color, nor does it coagulate the synthetic rubber latex should this be included in the coating formulation. The cost of an installation for this purpose was estimated at $9,000 to $10,000.

Calcium carbonate pigments

(R. W. Hagemeyer, Wyandotte Chemicals Corp.)

▶ Some striking changes in this pigment are in the making. Methods for lowering the adhesive requirement of the finer particle size calcium carbonate have already been accomplished. In a few years, finer particle size and higher finishing calcium carbonate should become available. Optimum particle size for opacity and brightness is 0.25 microns.

Chlorine Dioxide

(Continued from page 440)

pending upon the type of generation employed. These gases merely dilute the chlorine dioxide and have no effect on its stability.

Generators

Chlorine dioxide generators are of two types: wet and dry. Mathieson generators belong to the former classification and employ sodium chlorate, sulfur dioxide, and sulfuric acid. Cool-jackets enable easy control of temperature of the large reaction mass. Even if the cooling water ceased to flow, the temperature of the reactor would not rise more than 10° to 15° per hour above the operating level of 30° C. Since control of temperature for dry generators of the sodium chlorite-chlorine type is more difficult, concentrations of 4 to 5 per cent chlorine dioxide constitute a desirable operating value, which should not exceed 10 per cent.

Toxic aspects

For working conditions, the maximum allowable concentration of chlorine dioxide in air is estimated to be about 1 part per million. Concentrations of 5 ppm. are said to be irritating; the lethal value is below 19 ppm. Olin Mathieson reports that (1) the odor of chlorine dioxide is apparent at 17 ppm., (2) the gas irritates the nose and eyes at 45 ppm., (3) concentrations of 150 ppm. were fatal to guinea pigs in 44 minutes, (4) a test animal lived for a week when exposed to concentrations of 17 ppm. for 2 to 6 hours per day, and (5) rats could tolerate 10 ppm. of chlorine dioxide in drinking water.

In areas where chlorine dioxide is made or used, ventilation should be adequate, and personnel should be supplied with a chlorine-type breathing cannister and mouth piece. Exposure to tolerable concentrations of chlorine dioxide results in only temporary discomfort; no cumulative effects have been reported.

Convert Logs into High-Quality Chips

Step 1 — Remove the Bark

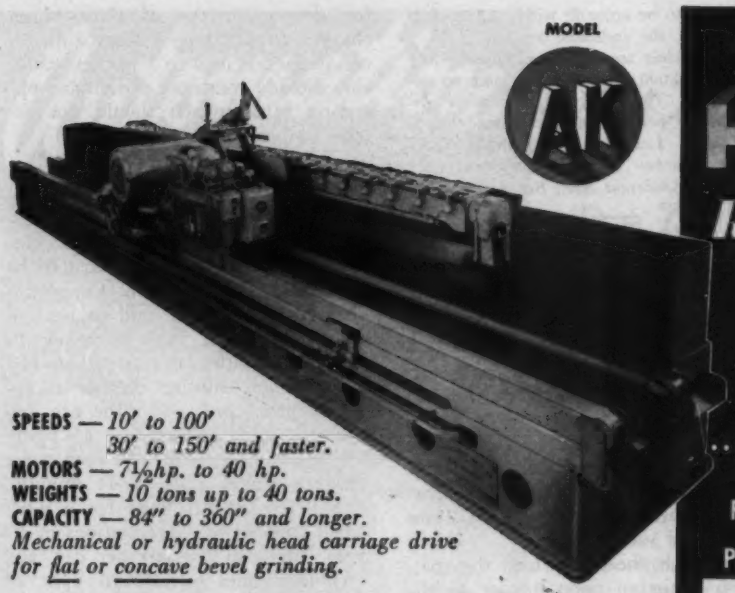
CARTHAGE BARKING DRUMS

thoroughly remove the bark with minimum brooming of the logs. Heavy all-welded design with full-length plates results in long service life and low maintenance.

Write for Complete Information

CARTHAGE MACHINE COMPANY

CARTHAGE, NEW YORK



MODEL AK

FOR ACCURACY — FINEST FINISHES

HANCHETT

knife grinders

for the

PULP AND PAPER INDUSTRIES

SPEEDS — 10′ to 100′
30′ to 150′ and faster.
MOTORS — 7½hp. to 40 hp.
WEIGHTS — 10 tons up to 40 tons.
CAPACITY — 84″ to 360″ and longer.
Mechanical or hydraulic head carriage drive for flat or concave bevel grinding.

Other Models.

CK — medium heavy duty — capacity 32″ to 184″

DK — normal production — capacity 32″ to 108″

FOR GRINDING — HOG — BARKER
PAPER TRIMMER AND DOCTOR BLADES

NEW MODEL SK-24
slitter knife grinder
FOR TOP — BOTTOM SLITTERS
CAPACITY 3″ TO 24″ DIAMETER
SEMI OR FULL AUTOMATIC
FINEST IN ACCURACY AND FINISH

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NEW LITERATURE

Books

FULL-TREE LOGGING — A CHALLENGE TO RESEARCH. By A. Koroleff. Published by the Pulp and Paper Research Institute of Canada. (Order from McGill University Book Store, 3480 University St., Montreal, P. Q., Canada.) 8½ x 11. 112 pages. Mimeographed and paper-bound. $3.50.

The object of this publication is to show, in the light of the available information, what are various important implications of full-tree logging as contrasted with conventional practices. It is more in the nature of a progress report than of a report on research carried to a successful conclusion.

The first section of this book presents background material. The second section on logging includes felling, skidding, working up trees at landings, branching, and bucking. Section three deals with silviculture and forest protection. Some of the principal uses for logging residues are discussed in Section Four. The fifth section discusses full-tree logging in foreign countries. Conclusions are stated in the sixth section.

The possible effects upon the forest soil of the removal of tree crown materials from the cutover in the course of full-tree logging are discussed by four authors in the first appendix. The succeeding four appendices contain the following articles: "Quality of Producer Gas from Various Tree Materials"; "Experience in Logging Waste Utilization"; "Status and Prospects of Charcoal Production in Eastern Canada," and "Comparative Characteristics of Short-Wood, Tree-Length and Full-Tree Logging Methods."

An extensive list of references is included in this book. Also included are photographs and diagrams.

AUXILIARY PAPER MILL EQUIPMENT. Vol. 4 of "Pulp and Paper Manufacture." Prepared under the direction of the Joint Textbook Committee of the Paper Industry of the U. S. and Canada. J. Newell Stephenson, editor-in-chief. Published by McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York 36, N. Y. 6½ x 9¼. 732 pages. $9.00.

This fourth volume in the "Pulp and Paper Manufacture" series includes material not treated before and is essentially supplementary to the first three volumes, which cover the materials, processes, and equipment used in the manufacture of pulp and paper. Auxiliary equipment that is not actually a part of the pulp and paper manufacturing process is dealt with in this book. Only up-to-date equipment and processes in actual use are presented.

This book takes into consideration those departments that supply water, steam, power, electricity, ventilation, the handling of fluid and solid materials, lubrication, process control, and the instruments employed in a paper mill. The principles, methods and applications of the topics discussed are presented in terms of practical use in pulp and paper mills.

CASE STUDIES IN INDUSTRIAL MANAGEMENT. By J. M. Juran and Norman N. Barish. Published by McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York 36, N. Y. 9 x 11¼. 250 pages. Spiral-bound. $5.00.

This book depicts in detail the operation of one company, Burndy Engineering Co. The material is divided into 16 sections. The first section contains a brief discussion of the company, including its history, ownership and financing. The book goes on to discuss organization; product development; plant location; manufacturing planning; plant layout; purchasing, receiving, storing, and inventory control; production control; quality control; cost control; plant maintenance; sales management; employment, selection, and training; industrial compensation; collective bargaining, and top management planning and controls. At the end of each section is a set of problems and questions dealing with the topic of the section.

Numerous photographs, diagrams, and actual papers showing how business is conducted add interest and clarity to the presentation.

Booklets and Pamphlets

SUGGESTIONS FOR IMPROVED PERFORMANCE. Published by Albany Felt Co., Albany, N. Y. 7¼ x 5. 80 pages. The purpose of this felt application handbook is to help paper mills achieve more efficient felt performance. It covers such topics as felt installation procedure, rolls and their effects upon felts, washing and conditioning techniques, chemical treatments and a

PAPER AND PAPERBOARD MAKING

By HARRY WILLIAMSON

Consulting Engineer and Author of

LESSONS IN PAPER MAKING

Pocket size, cloth bound text book of 372 pages covering all phases of stock preparation and sheet formation including the fundamental principles of making paper on the fourdrinier machine and paperboard on the multiple cylinder machine.

The author has fulfilled a life-long ambition to translate nearly fifty years of practical experience in a book that will be useful to the practical papermaker, technologist and executive.

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431 So. Dearborn Street, Chicago 5, Illinois

host of operating suggestions. The booklet also provides a number of plans for keeping felt records, along with methods of evaluating felt performance in order to make decisions relating to source of supply, design and optimum running periods. Numerous illustrations are included.

LIST OF PUBLICATIONS ON PULP AND PAPER (Report No. 444). Published by U. S. Forest Products Laboratory, Madison 5, Wis. 8 x 10. 43 pages. This booklet is divided into two sections. The first section lists publications of current interest, and the second lists publications of limited interest, publications superseded by later material and those of historical value. Publications include trade journal articles, processed reports, technical notes, bulletins and circulars, and other miscellaneous publications. Topics covered are as follows: pulpwood; pulp; chemical constitution of wood and pulp; paper and paperboard; structural fiberboard and hardboard; plastics and molded pulp products; pulping processes; pulping characteristics of woods; pulp processing and papermaking; pulp, paper, and wood wastes, and miscellaneous. Other publication lists issued by the Forest Products Laboratory are also described.

SOME ECONOMIC ASPECTS OF WHITE WATER TREATMENT IN PULP AND PAPER MILLS. (Technical Reprint T-122). By V. J. Calise and R. J. Keating. Reprinted by Graver Water Conditioning Co., 216 W. 14th St., New York 11, N. Y. 8½ x 11. This reprint of a technical paper presented at the Ninth Industrial Waste Conference at Purdue University discusses some of the economic factors entering into the selection and operation of white water treatment equipment in pulp and paper industries. The several methods of white water treatment, the types of equipment used and the limiting factors in the use of each type are covered. Detailed illustrations of the equipment are shown, as well as detailed economic calculations of the costs and savings that can be realized by the use of white water treatment.

New Literature . . .

Manufacturers' Publications

Through the co-operation of manufacturers and suppliers, THE PAPER INDUSTRY lists the following catalogues, bulletins and booklets. They may be obtained without cost or obligation, unless otherwise specified, by writing direct to the manufacturers. Please address requests on your company letterhead.

Wire Rope Electric Hoists. Yale & Towne Mfg. Co., Dept. PI, Materials Handling Div., 11000 Roosevelt Blvd., Philadelphia 15, Pa.—16-page Brochure P-495-A describes the Yale "Cable King" line of wire rope electric hoists. Many illustrations, cutaway photographs, charts and diagrams are included.

Doctors. Lodding Engineering Corp., Dept. PI, Worcester, Mass.—24-page Catalogue G-4 contains information on the following: doctor blades; blade holders; hydraulic oscillation; doctor terminology; fourdrinier, press, dryer, calender, reel drum, creping, and miscellaneous roll doctors, and water boxes. Numerous photographs and diagrams are included.

Screening Equipment. Link-Belt Co., Dept. 154, 307 N. Michigan Ave., Chicago 1, Ill.—Screening equipment for the removal of solids from water, sewage and industrial waste is described in a new 28-page book, No. 2587. It gives complete dimension and specification data for four types of coarse screens for removing large solids and three types of fine screens (with screen cloth) for removal of small solids. Tables to determine the proper size unit for handling various capacities are given. Over 30 photographs of screening installations are included.

Industrial Instruments & Equipment. Minneapolis-Honeywell Regulator Co., Dept. PI, Wayne & Windrim Aves., Philadelphia 44, Pa.—24-page Catalogue 5002 is a new issue of the composite catalogue which briefly describes industrial instruments and equipment, including the latest developments. Each description includes a reference to more detailed literature.

Mechanical Seals. Chemical & Power Products, Inc., Dept. PI, 11 Broadway, New York 4, N. Y.—Bulletin CP551, containing 4 pages describes the new line of Chempro "wedgelock" mechanical seals.

Centrifugal Stock Pumps. Goulds Pumps, Inc., Dept. PI, Seneca Falls, N. Y.— This 8-page bulletin, No. 723.1, gives specifications, materials of construction, and charts interchangeability of parts and performance curves of Fig. 3135 centrifugal stock pumps.

Steam Pump. Warren Steam Pump Co., Inc., Dept. PI, Warren, Mass.—The advantages of the "Realwear" horizontal duplex steam pump with piston valve steam chest are explained in the new 4-page Bulletin 230. Sectional and exterior views, specifications, capacities, dimensions, etc., are included.

Water Conditioning. Allis-Chalmers Mfg. Co., Dept. PI, 991 S. 70th St., Milwaukee, Wis.—Supplementary treatments for boiler make-up water are discussed in a new 3-page bulletin, designated 28X8226. A description of A-C No. 40 Series supplementary treatments and their use is given.

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Coming Events

Tappi

Sept. 15-17—Fifth Fundamental Research Conference, Institute of Paper Chemistry, Appleton, Wis.

Sept. 19-21—Second Mechanical Pulping Conference, Poland Spring House, Poland Spring, Maine

Oct. 5-7—Fifth Corrugated Containers Conference, Morrison Hotel, Chicago

Sept. 28-30—Sixth Testing Conference, Hotel Sheraton Kimball, Springfield, Mass.

Oct. 19-21—Ninth Alkaline Pulping Conference, Hotel Patten, Chattanooga, Tenn.

Nov. 7-9—Tenth Engineering Conference, Rice Hotel, Houston, Texas

American Pulp & Paper Mill Superintendents Association

Sept. 1-3—New York-Canadian Div., Saranac Inn, Upper Saranac Lake, N. Y.

Sept. 16-17—Northwestern Div., Hotel Northland, Green Bay, Wis.

Sept. 22-24—Northeastern Div., Poland Spring House, Poland Spring, Maine

Other meetings

Sept. 19-21—National Paper Trade Association, Conrad Hilton Hotel, Chicago

Oct. 9-13—Electrochemical Society Inc., William Penn Hotel, Pittsburgh

Oct. 17-21—43rd National Safety Congress and Exhibition, Chicago

Oct. 20-21—Forest Products Research Society (Northeast Section), Prince George Hotel, New York, N. Y.

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Pulp and Paper, Volume 1	$18.00
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Modern Pulp and Paper Making	9.50
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Paper and Paperboard Making	6.00
Procedure Handbook of Arc Welding	2.00
Outside U.S.A.	2.50
Drying of Paper on the Machine	1.50
Notes and Observation on Beaters	1.00
Lessons in Papermaking—Part 1	1.00
Lessons in Papermaking—Part 2	1.00
Trouble on the Paper Machine	.75
Pulp Bleaching (A Symposium)	.50
Technology of Papermaking Fibres	.50

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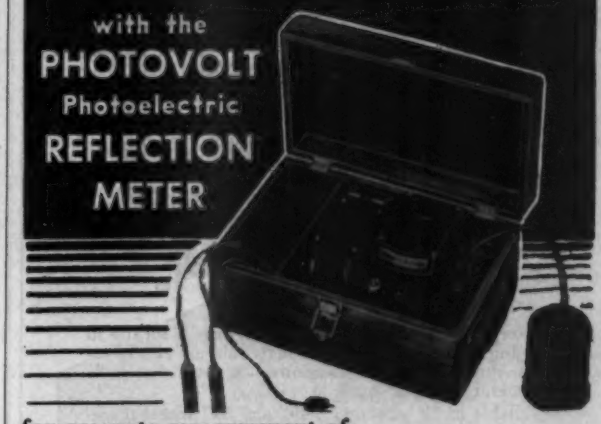

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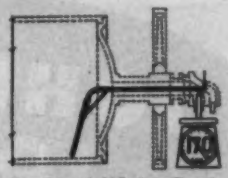
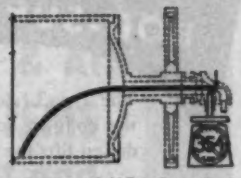


Reaction of ¾" Auto-Flex in 48" diameter dryer. Very low leverage.



Reaction of ½" ordinary bent pipe syphon in 48" diameter dryer. Very high leverage.

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Ross Midwest Auto-Flex syphons have been on the market for years, thousands have been sold—and here's why.

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The Ross Midwest Auto-Flex fits all steam joints so order yours and quit worrying about syphon troubles.

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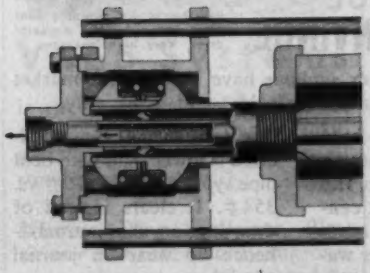
JOHNSON JOINT

ROD-SUPPORTED TYPE

The Type LJ Johnson Joint has lugs cast right on the body to accommodate supporting rods. This design lifts the weight of the body from the rotating assembly—permits it to "float" freely inside. Joint shown at left is for syphon pipe service, has steam inlet in side of body 90° from lugs. Type LJ is also available for thru flow service.



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The Johnson Corporation

845 Wood St., Three Rivers, Mich.

MARKET QUOTATIONS

RAGS (Domestic)

NEW RAGS

The following are quotations to mills, f.o.b. New York: per cwt.

No. 1 White Shirt Cuttings	15.00 to 15.50
New Unbleached Muslins	16.50 to 17.00
Fancy Shirt Cuttings	7.00 to 7.50
No. 1 Percales	7.00 to 7.50
No. 1 Washables	3.00 to 3.25
No. 1 Light Silesias	8.00 to 8.50
No. 1 Light Prints	6.00 to 6.25
Light Flannelettes	8.00 to 8.50
Cottonades	3.75 to 4.00
Blue Overalls	8.00 to 8.50
Blue Cheviots	8.00 to 8.50
Canton Flannels, Bleached	11.50 to 12.00
Canton Flannels, Unbleached	11.50 to 12.00
Osnaburg Cuttings	10.00 to 11.00
Underwear Cuttings, Bleached	16.00 to 16.50
Underwear Cuttings, Unbleached	16.00 to 16.50
Khaki Cuttings—	
Suw Tan	6.50 to 6.75
Mixed	3.75 to 4.00
Linen Cuttings—	
American	7.50 to 8.00
White	13.00 to 14.00
Grey	13.00 to 14.00

RAGS (Domestic)

OLD RAGS

Quotations to consuming mills, dollars per hundred pounds, f.o.b. New York, follow:

Roding	Per cwt.
No. 1	1.70 to 1.80
No. 2	1.40 to 1.50
No. 3 and 4	1.10 to 1.20
Twos and Blues—	
Repacked	2.50 to 2.75
Thirds and Blues—	
Repacked	2.15 to 2.40
Miscellaneous	1.85 to 2.00
Whites, No. 1—	
Repacked	4.00 to 4.25
Miscellaneous	3.25 to 3.50
White, No. 2—	
Repacked	3.00 to 3.25
Miscellaneous	2.50 to 2.75

RAGS (Foreign)

ex dock New York City

NEW RAGS

	per cwt.
New Dark Cuttings	Nominal
New Mixed Cuttings	
New Light Silesias	
Light Flannelettes	
Unbleached Cuttings	
New White Cuttings	
New Light Oxfords	
New Light Prints	

RAGS (Foreign)

ex dock New York City

OLD RAGS

	per cwt.
No. 1 White Linens	Nominal
No. 2 White Linens	
No. 3 White Linens	
No. 4 White Linens	
No. 1 White Cottons	
No. 2 White Cottons	
No. 3 White Cottons	
No. 4 White Cottons	
Extra Light Prints	
Ord. Light Prints	
Med. Light Prints	
Dutch Blue Cottons	
French Blue Cottons	
French Blue Linens	
Checks and Blues	
Linsey Garments	
Dark Cottons	
Old Shoppers	

ROPE and BAGGING

f.o.b. and ex dock New York City

	per cwt.
Gunny No. 1—	
Foreign	5.50 to 6.00
Domestic	5.50 to 6.00
Wool Tares—	
Light	5.50 to 6.00
Heavy	5.75 to 6.25
No. 1 Scrap Bagging	4.50 to 5.00
Manila Rope—	
No. 1 large	5.25 to 5.50
No. 1 small	4.25 to 4.50
Sisal Rope—	
No. 1 large	4.75 to 5.00
No. 1 small	4.25 to 4.50
New Burlap Cuttings	5.75 to 6.25
Jute Threads—	
Foreign (Nom.)	6.00 to 6.25
Domestic	6.25 to 6.50
Strings—	
No. 1 sisal	4.75 to 5.00
No. 2 sisal	4.25 to 4.50
Soft jute	4.75 to 5.00
Mixed	2.50 to 2.75

WASTE PAPER

The following are quotations, dollars per ton, for No. 1 packing f.o.b. New York:

Shavings—	per ton
Hard White Env. Cuts.	125.00 to 135.00
Hard White No. 1	100.00 to 105.00
Soft White, one-cut	75.00 to 80.00
Soft White, No. 1	60.00 to 65.00
Coated Soft	40.00 to 45.00
Fly Leaf No. 1	25.00 to 30.00
Fly Leaf, Woody No. 1	25.00 to 30.00
No. 2 Mixed Col. Woody	20.00 to 25.00
Flat Stock—	
No. 1 Heavy Books and Magazines, Repacked	23.00 to 25.00
Mixed Books	17.00 to 18.00
Ledger Stock—	
No. 1 White	60.00 to 65.00
No. 1 Mixed (Colored)	40.00 to 45.00
Manilas—	
New Env. Cuttings	70.00 to 75.00
New Cuts, One-Cut—	
Extra Manilas	22.00 to 24.00
Manila Tab Cards, Free of Ground Wood	85.00 to 95.00
Colored Tab Cards	60.00 to 65.00
Kraft—	
New Envelope Cuttings	65.00 to 70.00
Tripled Sorted No. 1 100%	40.00 to 45.00
No. 1 Old Assorted	30.00 to 35.00
News—	
White Blank	70.00 to 75.00
Overissue	26.00—
No. 1 Folded	22.00—
Old Corrugated Containers	32.00—
New Jute Corrugated Cuts	35.00—
Mill Wrappers	22.00—
Box Board Chips	14.00—
No. 1 Mixed Paper	14.00—

CHEMICALS

f.o.b. shipping point

Alum (Papermakers)—	
Lump, cwt.	5.05—
Ground, cwt.	4.30—
Powdered, cwt.	5.10—
Blanc Fixe—	
Pulp, bulk, ton	100.00—
Dry, barrels	105.00—
Bleaching Powder—	
Drums, cwt	5.00 to 6.00
Casein (Domestic Standard) 20-30 mesh (bags), lb.	
80-100 mesh (bags), lb.	27.00 to 29.00
Argentine, lb.	23.50 to 24.00
China Clay—	
Domestic Filler Bulk (mine) ton	10.00 to 13.00
Domestic Coating Bulk (mine) ton	17.00 to 25.00
Imported (ship side) Bulk (lump) ton	20.00 to 30.00
Chlorine—	
Tank cars (wks) cwt.	2.25—
Gelatine (silicon), lb.	1.25 to 1.35
Glyc. (C.P.) drums, lb.	.29½ to .30
Litharge, powd. bbl. lb.	.16½ to .17

MARKET QUOTATIONS

Rosin (Gum)— New York, per 100 lbs.
E ..... 9.25—
F ..... 9.25—
G ..... 9.25—
WW ..... 9.40—

Rosin (Wood), carlots, F.O.B. South .... 5.75—

Salt Cake—
Dom. bulk (wks) ton 28.00 to 29.00
Imp. bulks on dock— (Atl. ports) ton (Nom.) ..... 22.00—

Soda Ash—
Bulk (works) cwt... 1.35—
Paper bags, cwt..... 1.65—

Soda (Caustic)—
Solid drums, cwt.... 3.85 to 4.50
Ground and flake, drums, cwt..... 4.25 to 5.00

Sodium Silicate—
60 deg. 55 gal. drums, (works) cwt..... 1.60 to 1.70
40 deg. 35 gal. drums, (works), cwt..... 1.35 to 1.40

Starch—
Pearl, 140 lb. bags, cwt. ..... 6.39—
Pearl, barrels, cwt... 6.89—
Paper (Sp.) bags, cwt. 6.39—
Powdered, barrels, cwt. 6.60—

Sulphur (Crude)
(Mine) bulk, long ton 26.50 to 28.00

Talc—
Dom. 100 lb. bags (mine) ton ..... 25.00 to 28.00
Canadian ..... 35.00 to 45.00

Titanium Dioxide—
Barium Pig, bbls., lb. .22½ to .23
Calcium Pig, bbls., lb. ..... .22½ to .23

Zinc Oxide, bags ..... 14.00 to 15.50

WOOD PULP

Quotations on domestic and Canadian wood pulp, dollars per short air dry ton, delivered consuming mills including basic freight allowances, follows:

Bleached Sulphite ....145.00—
Bleached Sulphite, Canadian .....145.00—
Unbleached Sulphite ...120.00—
Unbleached Sulphite, Canadian .....125.00—
Bleached Soda .....142.00 to 142.50
Bleached Soda, Canadian.142.00 to 142.50
Kraft Bleached .....147.00 to 150.00
Kraft, Bleach., Hardwood .....145.00—
Kraft, Bleach., Southern.150.00—
Kraft, Bleach., Canadian.150.00—
Kraft, Unbleached, Northern .....132.50—
Kraft, Unbleached, Southern .....115.00—
Kraft, Unbleached, Canadian .....110.00 to 115.00
Kraft, Semi-Bleached, Southern .....130.00 to 135.00
Sulphite Screenings .... 72.50—
Sulphate Screenings .... 67.50—
Groundwood ..... 75.00 to 85.00

Quotations on imported wood pulp, dollars per short ton, on dock American Atlantic ports with varying freight allowances, follow:

Bleached Sulphite, Swedish .....142.50—
Bleached Sulphite, Norwegian, freight allowed.142.50—
Bleached Sulphite, Finnish, freight allowed..145.00—
Unbleached Sulphite, Swedish .....125.00—
Unbleached Sulphite, Finnish freight allowed..125.00—
Kraft, Unbleached, Swedish, freight allowed..110.00 to 115.00
Kraft, Unbleached, Finnish, freight allow.110.00 to 140.00
Kraft, Bleached, Swedish, on dock....147.50—
Kraft, Bleached, Norwegian .....147.50—

PAPER

Quotations are mill quotations New York City

Boards—
Prices per ton, delivered in New York, 10 tons or more:

Plain chip ..... 85.00—
News vat lined chip ... 90.00—
.009 chip, rolls ..... 90.00—
Filled news ..... 85.00—
Solid news ..... 90.00—
White vat lined chip..125.00—
Chip tube and can stock.100.00—
Single manila lined chip.140.00—
Single jute lined chip..125.00—
Kraft liner .....125.00 to 132.50

White patent coated:
.020 .....155.00—
.018 .....157.50—
.016 .....160.00—

Book Paper f.o.b. New York— per cwt.

Machine coated, two sides
70 lb. No. 2 enamel; 25x 4 cases $17.25
38-500, trimmed 4 sides. Carloads $16.30
45 lb. enamel, 25x38-500, 4 cases $13.05
trimmed 4 sides..... Carloads $12.10

Uncoated
55 lb. No. 2 offset, 25x38 4 cases $14.80
500, trimmed 4 sides.... Carloads $13.85
50 lb. A Grade English Finish, 25x38-500, un trimmed 4 cases $14.05
..... Carloads $13.10
20 lb. envelope, 17x22-500, untrimmed ..... Carloads $12.40
16 lb. tablet, 17x22-500 ..... Carloads $11.35

Rag Content Bond—
(White, 5,000 to 10,000 lbs., basis 16 lb.)
100% rag..... 58.80—
75% rag..... 45.45—
50% rag..... 36.20—
25% rag..... 29.70—

Rag Content Ledger—
(White, 5,000 to 10,000 lbs.)
100% rag..... 58.80—
75% rag..... 45.45—
50% rag..... 36.20—
25% rag..... 29.70—

Sulphite Bond—
(White, 5,000 to 10,000 lbs., basis 16 lb.)
No. 1..... 20.10—
No. 2..... 20.40—
No. 4..... 17.75—

Sulphite Ledger—
(White, 5,000 to 10,000 lbs.)
No. 1..... 20.50—
No. 2..... 19.75—
No. 4..... 18.15—

News delivered in New York— per ton
Rolls, Standard (Contract) .....125.00 to 126.00
Rolls (Spot) ..... (Nominal)
Sheets .....138.00—

Tissues (Carlots) f.o.b. New York— per ream
White No. 1..... 1.75—
White No. 2 ..... 1.35—
Bleached Anti-Tarnish.. 2.20—
Colored ..... 2.00—
Anti-Tarnish Kraft .. 1.85—
Manila ..... 2.00—
Napkins, semi-crepe (12½ lb. to M shts.) per ct. ..... 1.00—
Napkins, full crepe and embossed (12½ lb. to M shts.) per ct. .. 1.00—
Toilet, Bleached (M shts.) per ct..... 9.35—
Toilet, Unbleached (M shts.) per ct. .. 7.80—

Towels f.o.b. New York— per case
Bleached ..... 6.80—
Unbleached ..... 5.90—

Wrappings (Kraft) f.o.b. New York— (Basis 50 lb. & heavier) per cwt.
Standard wrapping .... 8.25—
Butchers, counter rolls.. 8.50—
Standard bag, mill rolls. 7.75—
Shipping sack, mill rolls. 8.00—
Gumming, mill rolls.... 8.25—
Asphalting, mill rolls...8.00—
Envelope, mill rolls.... 9.50—

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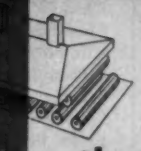
PIONEERS IN INDUSTRIAL VENTILATION



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Here are three film sets that will help you arouse and keep alive interest in your safety program. And there is no better way to teach foremen how to be better supervisors.

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A brand new set of films that will teach your foremen and supervisors the tips they should know about making safety talks, and how to transmit management's ideas and plans. Six 35mm sound slidefilms and leader's manual in an attractive leatherette case.

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This is a series of six 35mm sound slidefilms with leader's manual that may be used for an advanced safety course. Each film deals with one aspect of the complex art of handling people. Collectively, the films show how to train workers, how to keep experienced people on their toes and how to win respect, cooperation and loyal support.

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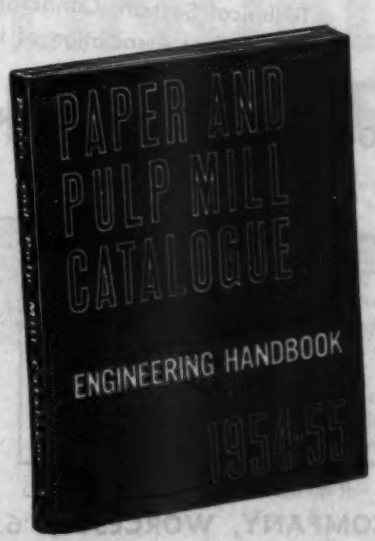

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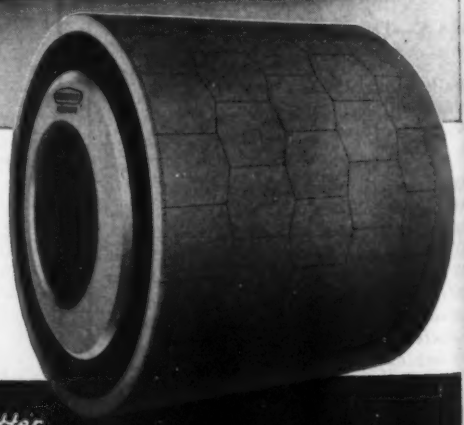

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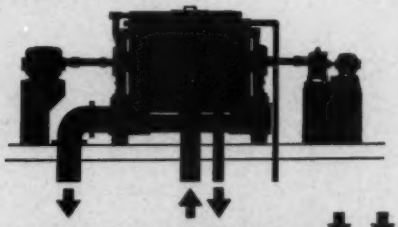

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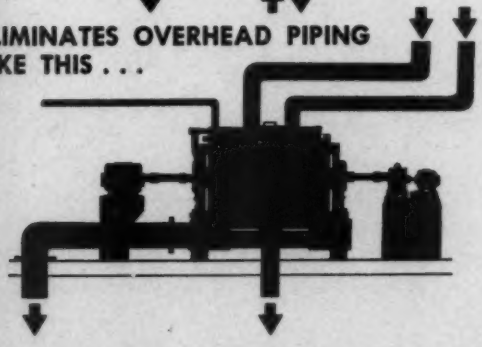

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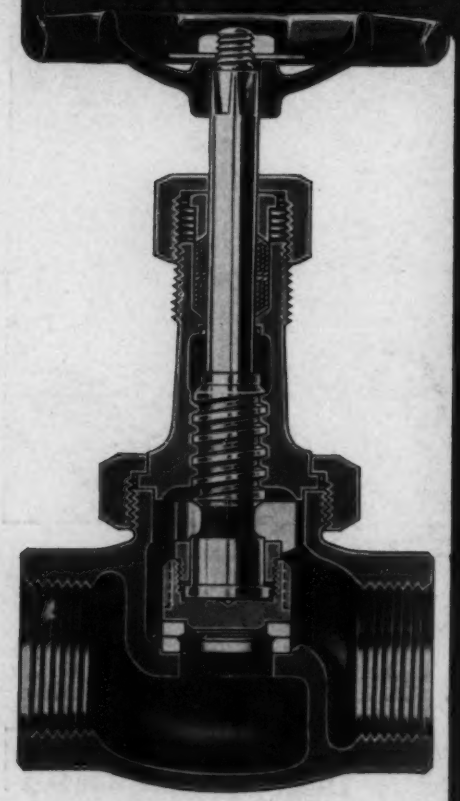

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